



RF/ER-96-0046

Annual Update for the Historical Release Report



August 1996

ANNUAL UPDATE

FOR AUGUST 1, 1995 THROUGH
AUGUST 1, 1996

HISTORICAL RELEASE REPORT (HRR)

PREPARED BY

ENVIRONMENTAL RESTORATION

ROCKY MOUNTAIN REMEDIATION SERVICES, L.L.C.

SEPTEMBER 1996
HRR ANNUAL UPDATE

ANNUAL UPDATE

FOR AUGUST 1, 1995 THROUGH
AUGUST 1, 1996

HISTORICAL RELEASE REPORT (HRR)

PREPARED BY

ENVIRONMENTAL RESTORATION

ROCKY MOUNTAIN REMEDIATION SERVICES, L.L.C.

SEPTEMBER 1996

AGENCY ACCEPTANCE FORM

HRR ANNUAL UPDATE 1

The recommendations of the Department of Energy (DOE) with regard to the need for future actions, or the lack of the need for future actions, are included in each PAC narrative description included in this annual update. Any IHSS or PAC for which a decision is deferred will be addressed in future HRR updates.

Exceptions to the recommended actions should be noted below or attach comments to this form as needed:

Please provide comments and/or acceptance within 30 days from receipt of annual update submittal, or the document will be considered acceptable as is.

DOE Signature	CDPHE Signature	EPA Signature
	<input type="checkbox"/> CDPHE agrees with recommendations	<input type="checkbox"/> EPA agrees with recommendations
	<input type="checkbox"/> CDPHE disagrees with recommendations; see comments	<input type="checkbox"/> EPA disagrees with recommendations; see comments
<hr/> <hr/>	<hr/> <hr/>	<hr/> <hr/>
DOE Concurrence	CDPHE Signature and Position	EPA Signature and Position

TABLE OF CONTENTS

DESCRIPTION	PAGE
HRR ANNUAL UPDATE AGENCY ACCEPTANCE FORM	i
ABBREVIATIONS, ACRONYMS, AND INITIALISMS	vi
1.0 INTRODUCTION	1
2.0 NEW PAC NARRATIVES	5
PAC REFERENCE NUMBER: 500-909	6
(Release of Spent Photographic Fixer Solution)	
3.0 REVISED PAC NARRATIVES	8
PAC REFERENCE NUMBER: NE-142.12	9
(OU- 6, IHSS 142.12, Retention Pond A-5; Walnut and Indiana Pond)	
PAC REFERENCE NUMBER: NE-166.1, NE-166.2 and NE-166.3	14
(OU- 6, IHSSs 166.1 - 166.3, Trenches A, B and C, South of Present Landfill)	
PAC REFERENCE NUMBER: NE-167.2 and NE-167.3	21
(OU- 6, IHSSs 167.2 and 167.3, Landfill Center and South Area Spray Fields)	
PAC REFERENCE NUMBER: NE-216.1	24
(East Spray Field, North Area)	
PAC REFERENCE NUMBER: NW-195	29
(Nickel Carbonyl Disposal)	
PAC REFERENCE NUMBER: NW-203	32
(Inactive Hazardous Waste Storage Area)	
PAC REFERENCE NUMBER: 000-168	35
(OU-11, IHSS 168, West Spray Field)	
PAC REFERENCE NUMBER: 000-192	38
(Antifreeze Discharge)	
PAC REFERENCE NUMBER: 300-708	41
(Transformers North of Building 371)	

PAC REFERENCE NUMBER: 700-1112	77
(Leaking Transformer, Building 776-5)	
PAC REFERENCE NUMBER: 800-178	79
(OU-15, IHSS 178, Building 881 Drum Storage Area)	
PAC REFERENCE NUMBER: 800-179	82
(OU-15, IHSS 179, Building 865 Drum Storage Area)	
PAC REFERENCE NUMBER: 800-180	85
(OU-15, IHSS 180, Building 883 Drum Storage Area)	
PAC REFERENCE NUMBER: 800-211	88
(OU-15, IHSS 211, Building 881 Drum Storage Area, Unit 26)	
PAC REFERENCE NUMBER: 800-217	91
(OU-15, IHSS 217, Building 881 Cyanide Bench Scale Treatment, Unit 32)	
PAC REFERENCE NUMBER: 800-1207	94
(Transformer 883-4)	
PAC REFERENCE NUMBER: 800-1208	96
(Transformer 881-4)	
PAC REFERENCE NUMBER: 800-1209	98
(Leaking Transformers, 800 Area)	
PAC REFERENCE NUMBER: 800-1210	100
(Transformers 865-1 and 865-2)	
PAC REFERENCE NUMBER: 900-1306	102
(Transformers 991-1 and 991-2)	
4.0 ENVIRONMENTAL PROJECT STATUS (to date)	104
(Current Status for IHSS Remediation/Source Removal Actions)	
PAC REFERENCE NUMBER: NE-110	105
(Trench T-3)	
PAC REFERENCE NUMBER: NE-111.1	107
(Trench T-4)	
PAC REFERENCE NUMBER: 000-121	110
(Original Process Waste Lines)	

	PAC REFERENCE NUMBER: 400-129	113
	(Oil Leak)	
	PAC REFERENCE NUMBER: 900-109	115
	(Trench T-2 - Ryans Pit)	
	PAC REFERENCE NUMBER: 900-119.1	118
	(West Scrap Metal Storage and Solvent Spill Area)	
	PAC REFERENCE NUMBER: 900-119.2	121
	(East Scrap Metal Storage Area and Solvent Spill)	
5.0	TABLE 1	124
	(Listing of PACs Identified in Quarterly Updates Since the June 1992, Historical Release Report)	
6.0	TABLE 2	129
	(Listing of Original PACs Submitted in the June 1992, Historical Release Report)	
7.0	TABLE 3	134
	(New PACs and PAC/IHSS Revisions Identified in the First Annual Update, August 1996)	
8.0	REVISED IHSS and PAC MAPS	139

ABBREVIATIONS, ACRONYMS, AND INITIALISMS

AAC	Additional Area of Concern
AEC	Atomic Energy Commission
ARA	Accelerated Response Action
ARARs	Applicable or Relevant and Appropriate Requirements
BRA	Baseline Risk Assessment
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment & Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
COC	Chemicals of Concern
CPIR	Contingency Plan Implementation Report
D&D	Decontamination and Decommission
dpm	disintegrations per minute
DOE	U.S. Department of Energy
ECOC	Ecological Chemicals of Concern
EG&G	EG&G Rocky Flats, Inc.
EPA	U.S. Environmental Protection Agency
ERA	Ecological Risk Assessment
ER	Environmental Restoration
FIDLER	Field Instrument for the Detection of Low-Energy Radiation
FSP	Field Sampling Plan
HI	Hazard Index
HEAST	Health Effects Assessment Summary Tables
HEPA	High Efficiency Particulate Air
HHRA	Human Health Risk Assessment
HPGe	High Purity Germanium
HRR	Historical Release Report
HSP	Health and Safety Plan
IHSS	Individual Hazardous Substance Site
LAG	Interagency Agreement
IM/IRA	Interim Measure/Interim Remedial Actions
IRIS	Integrated Risk Information System
MRI	Midwest Research Institute
NA	No Action
nCi/g	nanocuries per gram
NCP	National Contingency Plan
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
OPWL	Original Process Waste Lines
OU	Operable Unit
OVM	Organic Vapor Monitor

PA	Protected Area
PAC	Potential Area of Concern
PAH	Polynuclear Aromatic Hydrocarbon
PAM	Proposed Action Memorandum
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PCOC	Potential Contaminants of Concern
pCi/g	picocuries per gram
PEL	Permissible Exposure Limit
PID	Photoionization Detector
ppb	part per billion
ppm	part per million
RBC	Risk Based Concentration
RCRA	Resource Conservation and Recovery Act
RCRA 3000(u)	Appendix 1, Waste Management Units in RCRA Part B Permit Application
RFCA	Rocky Flats Cleanup Agreement
RFFO	Rocky Flats Field Office
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RI	Remedial Investigation
RMRS	Rocky Mountain Remediation Services, L.L.C.
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
STP	Sewage Treatment Plant
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TCA	1,1,1-trichloroethane
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TM	Technical Memorandum
TRU	Transuranic
TSCA	Toxic Substances Control Act
TSS	Total Suspended Solids
UBC	Under Building Contamination
ug/kg	micrograms per kilogram
ug/l	micrograms per liter
UST	Underground Storage Tank
VOC	Volatile Organic Compound

SECTION 1.0

INTRODUCTION

1.0 INTRODUCTION

This Annual Update to the Historical Release Report (HRR) provides a variety of information pertaining to spills, releases, or findings of contaminants at the Rocky Flats Environmental Technology Site (RFETS). In accordance with the Rocky Flats Cleanup Agreement (RCCA) finalized July 19, 1996, spills, releases or findings which require notification in this report are identified as Potential Areas of Concern (PACs) and are described in a format consistent with the original HRR submitted in 1992 and updated quarterly between 1992 and 1995. The original intent of the HRR was to capture existing information on historical incidents involving hazardous substances at RFETS and continue the reporting process for current incidents involving the release of hazardous substances. Prior to the finalization of the Interagency Agreement (IAG)(DOE, 1991), areas of known contamination were referred to as Solid Waste Management Units (SWMUs). This terminology was changed to Individual Hazardous Substance Site(s) (IHSSs) in the IAG and has been used since January 1991. An IHSS by definition is an individual location where hazardous substances have come to be located at a discrete area within the site. These locations were designated for the purposes of the HRR as Potential Areas of Concern (PACs) and assigned a unique release number based upon the geographic location of the PAC and/or its status as an existing IHSS. PAC locations were then arranged according to 14 geographical subdivisions which are represented on the updated IHSS map in Section 8. In addition to the 14 geographic areas, potential under building contamination (UBC) sites were designated. This was necessary due to the potential contamination of soil and/or groundwater identified or suspected under specific buildings.

PAC narratives include Department of Energy, Rocky Flats Field Office (DOE, RFFO) recommendations for further action or no further action based upon process knowledge, analytical data, conservative risk based screens, or formally conducted personal interviews. The Agency Acceptance Form on the second page of this document will continue to be incorporated into the annual reporting process to reach concurrence or nonconcurrence on DOE, RFFO recommendations from the regulatory agencies for action or no action acceptance to relative PAC and IHSS issues.

Information for this annual report is structured as follows:

- Releases to the environment identified from August 1, 1995, through August 1, 1996;
- Revisions to Individual Hazardous Substance Site (IHSS) and PAC narratives which include newly proposed No Further Action (NFA) status based upon final Corrective Action Decision/Record Of Decision (CAD/ROD) acceptance, conservative risk based screening, or actual source removal of contaminants in accordance with approved Proposed Action Memorandums (PAMs) or other authorizing documentation.
- Detailed narratives describing the progress made and accelerated actions taken within the Environmental Restoration framework of field activities.

- An updated Individual Hazardous Substance Site map, and Potential Area of Concern map.
- A table listing PACs identified since the June 1992, HRR (Table 1) and a complete listing of PACs identified in the June 1992, HRR (Table 2). Table 3 is a table identifying new PAC/IHSS revisions in this annual update.

Section 2 describes new PACs occurring within the reporting period from August 1, 1995 through August 1, 1996. New PACs are defined as newly identified or suspected releases for which DOE has notified the Environmental Protection Agency (EPA) and Colorado Department of Public Health Environment (CDPHE). Section 3.0 is used to modify past PAC narratives based on additional information which becomes available after the reporting process has begun. Typically, additional information consists of validated analytical data from sampling, additional sample results from a later collection event, newly proposed No Further Action (NFA) status based upon: 1) final CAD/ROD acceptance, 2) conservative risk based screening; or 3) source removal of contaminants using accelerated action under approved Proposed Action Memorandums (PAMs) or other authorization basis.

Section 4, Environmental Project Status, provides detailed narratives describing progress made and accelerated actions taken within the Environmental Restoration framework of field activities. Recent implementation of Approved Proposed Action Memorandums have enabled CERCLA cleanup activities to proceed in an expedited manner. Activities include "hot spot" and source removals which have significantly reduced the risk to human health and the environment.

Table 1 (Section 5) provides a list of all PACs identified since the June 1992, HRR. It also provides a cross-reference for the associated Operable Unit (OU), IHSS numbers for spills occurring within an IHSS, a Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) cross-reference number and the number of the quarterly update in which the PAC was originally identified. **Table 2** (Section 6) provides a listing of all PACs referenced in the June 1992 version of the Historical Release Report (HRR) and **Table 3** (Section 7, beginning with this report) identifies and segregates new PACs and PAC or IHSS revisions which are inclusive to the annual reporting process. Up-to-date copies of IHSS and PAC maps are included in Section 8.0 at the end of the report. The IHSS map is formatted to be consistent with the original IAG HRR document for consistency and reflects the most current boundary location of IHSSs based on work to date at the various Operable Units. The PAC map includes all PACs identified to date, as well as Under Building Contamination (UBC) sites.

In summary, this report is intended to provide a comprehensive compilation of historical information and current conditions at the RFETS with regard to environmental releases and current environmental project status. It is not the intention for this annual update or past quarterly updates to change or amend researched information in the original Historical Release Report (DOE, 1992) but rather to delineate fact on specific areas as it becomes available. More specific information such as regulatory agreements, analytical data and current status for

each PAC or IHSS is available in such documents as Final Operable Unit Work Plans, Technical Memorandums, Proposed Action Memorandums (PAMs), Accelerated Action Completion Reports etc., and should be reviewed prior to initiating work in these areas.

SECTION 2.0

NEW PAC NARRATIVES

**(PACS IDENTIFIED FROM AUGUST 1,
1995 THROUGH AUGUST 1, 1996)**

PAC REFERENCE NUMBER: 500-909

IHSS Reference Number: NA

Unit Name: Release of Spent Photographic Fixer Solution

CPIR No.: 96-001

Approximate Location: N750,000; E2,083,000

Date(s) of Operation or Occurrence

April 22, 1996

Description of Operation or Occurrence

At approximately 3:30 pm on April 22, 1996, workers discovered that a secondary containment system for a drum used to accumulate spent photographic fixer solution had overturned. The incident occurred on the west side of Building 551. The containment system and drum were immediately righted and the contents of the drum and containment system examined to determine whether a release to the environment had occurred. It was determined that approximately five to six gallons of the fixer solution had been released to the soil.

Physical/Chemical Description of Constituents Released

Silver (D011) is a common constituent in photographic fixer solution. The solution being accumulated was analyzed and was found to contain 8.8 ppm TCLP Silver.

Response to Operation or Occurrence

Efforts were initiated within 24 hours to remove contaminated soils in the immediate area of impact. Approximately one 55 gallon drum of soil was removed and transported to a RCRA Hazardous Waste Management Unit after radiological screening was performed. Two composite soil samples were collected in the area after cleanup. Analytical data confirmed that the contaminated soil had been removed. The excavation was filled with clean fill and the secondary containment system was secured to ensure that the incident would not recur. This incident did not result in any injury or potential hazard to human health or the environment.

Fate of Constituents Released to the Environment

One 55 gallon drum of soil potentially contaminated with EPA Waste Code D011 (Silver) was removed and transported to a RCRA Hazardous Waste Management Unit. No radiological contamination was found in the area of the release.

Action/No Action Recommendation

This PAC does not warrant further investigation due to the small amount of material released to the environment, the immediate cleanup response, and the cleanup verification samples showing that the release was adequately remediated.

Comments

None.

References

DOE, 1996, *RCRA Contingency Plan (CPIR No. 96-001)*, Rocky Flats Environmental Technology Site, Golden, CO, May.

SECTION 3.0

REVISED PAC NARRATIVES

PAC REFERENCE NUMBER: NE-142.12

IHSS Reference Number: 142.12 Operable Unit 6

Unit Name: Flume Pond (Walnut Creek Gauging Station) (IAG Name- Retention Pond A-5; RFI/RI Name - Walnut and Indiana Pond)

Approximate Location: N754,000; E2,094,000

Date(s) of Operation or Occurrence

Fall 1978 to present

Description of Operation or Occurrence

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), the flume pond is located on the Walnut Creek drainage immediately west of and upstream from Indiana Street. The flume pond was built at the same time that McKay Ditch was being re-routed away from the A-Series drainage. This flume pond is used to measure Walnut Creek flow. The Walnut Creek drainage has received discharges from Rocky Flats throughout the history of the plant. This pond was identified as an IHSS in the IAG.

Physical/Chemical Description of Constituents Released

The constituents potentially present in this IHSS are the same constituents as are potentially present in North Walnut Creek or South Walnut Creek (A-Series or B-Series drainages), as well as the McKay Ditch Bypass.

Response to Operation or Occurrence

This pond is cleaned out occasionally to reduce buildup of sediments on the bottom or to reconstruct the flumes. The sediments are placed on the south side of Walnut Creek upstream of the pond and within the IHSS boundary. A primary source of these sediments is the McKay Ditch Bypass, which was originally constructed as an unlined ditch, and therefore carried considerable amounts of entrained sediments.

In 1991, the flume pond was included in the IAG as IHSS 142.12 and slated for further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992 through 1993) sediment samples were collected at five different locations within the pond. One sample was collected within 5 feet of the pond inlet, one from the deepest part of the pond, and the remaining three samples were collected at random locations. Composite samples were collected from 2-foot intervals. Soil samples were analyzed for VOCs, SVOCs, pesticides/ PCBs, metals, radionuclides, and water quality parameters. Five surface water samples were collected from the pond: one from the deepest part, one within 5 feet of the inlet, one within 5 feet of the spillway,

and two were randomly collected. Surface water samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals (total and dissolved), radionuclides (total and dissolved), and water quality parameters. Two stream sediment samples were also collected: one sample was collected from McKay Ditch, just upstream from its confluence with Walnut Creek, and another was collected from Walnut Creek, just downstream from the pond spillway. These stream sediment samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, radionuclides, and water quality parameters. Groundwater samples were collected from two down-gradient alluvial monitoring wells (0486 and 41691).

Fate of Constituents Released to the Environment

From the media sampled in IHSS 142.12 during the OU 6 RFI/RI, only surface water and sediments were evaluated for No Action in this update. Groundwater issues are being addressed on a site-wide basis, initially through the Groundwater Conceptual Plan for RFETS. A CDPHE risk-based conservative screen was conducted on surface water, pond sediment, and stream sediment for IHSS 142.12. The results of this screen are reported in the final OU 6 Letter Report (DOE, 1994). A background comparison was conducted as the first part of the conservative screen; none of the inorganic and radionuclide constituents in these media were detected in concentrations greater than background (mean plus 2 standard deviations). All organic chemicals detected in each media are considered Potential Contaminants of Concern (PCOC) and are listed in Table 1. Although acetone was originally included in the conservative screen as the only surface water PCOC, subsequent comparison to laboratory blank data indicates that its presence in surface water samples was due to laboratory contamination.

Action/No Action Recommendation

In accordance with the No Action decision criteria developed mutually by DOE, EPA, CDPHE, Kaiser-Hill, and RMRS (RMRS 1996), any geographic area that passes the CDPHE conservative screen is a candidate for No Action. Passing the conservative screen requires a carcinogenic and non-carcinogenic risk ratio sum of below 1. As seen in Table 1, for pond sediment the carcinogenic ratio sum is 2.84×10^{-3} and the noncarcinogenic ratio sum is 3.34×10^{-5} . Both of these values are below 1. These ratios differ somewhat from those presented in the OU 6 Letter Report (DOE, 1994) because methylene chloride was subsequently determined to be a laboratory contaminant and was omitted from the data set (DOE, 1995a). Results of the screen on stream sediment samples (Table 1) show a carcinogenic risk ratio sum of 3.73×10^{-3} and a noncarcinogenic risk ratio sum of 3.36×10^{-5} ; both sums are below 1.

IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure. As shown in Table 2, the carcinogenic and noncarcinogenic risk ratio sums for dermal exposure for both pond and stream sediment are below 1. Tables 1 and 2 indicate that the risk to human health from exposure to pond and stream sediment at IHSS 142.12 is minimal, based on the exposure assumptions for the residential scenario.

The No Action decision criteria (RMRS 1996) states that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA

process. Results of the draft *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site*, which appears as Appendix F in the OU 6 RFI/RI report (DOE, 1995a), were used to determine the potential ecological threat from exposure to sediment constituents at IHSS 142.12. According to the ERA, there is little risk to the environment based on chemical concentrations detected in this IHSS.

Based on the above evidence, the No Action decision criteria are met for IHSS 142.12, Walnut and Indiana Pond.

Table 1. RBC¹ Screen for IHSS 142.12, Walnut and Indiana Pond

Pond Sediment

Analyte ²	Maximum Concentration (mg/kg)	Residential Soil RBCs		Ratio of Concentration to RBC	
		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Organics:					
2-Butanone	0.051	-	1.65E+05	-	3.09E-07
Acetone	0.21	-	2.74E+04	-	7.66E-06
Benzoic Acid	0.5	-	1.10E+06	-	4.55E-07
bis(2-Ethylhexyl)phthalate	0.13	4.57E+01	5.43E+03	2.84E-03	2.39E-05
Phenol	0.11	-	1.65E+05	-	6.67E-07
Toluene	0.018	-	5.49E+04	-	3.28E-07
			Ratio Sum	2.84E-03	3.34E-05

Stream Sediment

Analyte ³	Maximum Concentration (mg/kg)	Residential Soil RBCs		Ratio of Concentration to RBC	
		Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Organics:					
Benzoic Acid	0.17	-	1.10E+06	-	1.55E-07
Benzyl alcohol	0.041	-	8.23E+04	-	4.98E-07
bis(2-Ethylhexyl)phthalate	0.17	4.57E+01	5.43E+03	3.72E-03	3.13E-05
Di-n-butyl phthalate	0.045	-	2.74E+04	-	1.64E-06
			Ratio Sum	3.72E-03	3.36E-05

¹ RBC = Risk-based concentration; chemical-specific RBCs are presented in the Programmatic Risk-based Preliminary Remediation Goals (DOE 1995b). The RBCs used in this conservative screen were based on a residential scenario for exposure to soil.

² Methylene chloride was originally included in the RBC screen; however, subsequent comparison to laboratory blank data indicate that its presence in pond sediment samples is due to laboratory contamination.

³ Benzoic acid and bis(2-ethylhexyl)phthalate were detected in the stream sediment sample collected in McKay Ditch, upstream from its confluence with North Walnut Creek. Benzyl alcohol and di-n-butyl phthalate were detected in the stream sediment sample collected from Walnut Creek, just downstream from the pond spillway.

Table 2. RBC Screen for IHSS 1A2.12 - Dermal Exposure

Pond Sediment

Analyte	Max. Conc. (mg/kg)	Oral Slope Factor ¹	Oral RfD ¹	Cancer Intake Factor ²	Noncancer Intake Factor ²	Residential Dermal RBCs (mg/kg) ³		Ratio of Conc. to RBC	
						Cancer	Noncancer	Cancer	Noncancer
2-Butanone	0.051	-	6.00E-01	-	2.80E-07	-	2.14E+06	-	2.38E-08
Acetone	0.21	-	1.00E-01	-	2.80E-07	-	3.57E+05	-	5.88E-07
Benzoic Acid	0.5	-	4.00E+00	-	2.80E-07	-	1.43E+07	-	3.50E-08
bis(2-Ethylhexyl) phthalate	0.13	1.40E-02	2.00E-02	8.54E-08	2.80E-07	8.36E+02	7.14E+04	1.55E-04	1.82E-06
Phenol	0.11	-	6.00E-01	-	2.80E-07	-	2.14E+06	-	5.13E-08
Toluene	0.018	-	2.00E-01	-	2.80E-07	-	7.14E+05	-	2.52E-08
Dermal Ratio Sum								1.55E-04	2.54E-06
Screen Ratio Sum								2.84E-03	3.34E-05
Total Ratio Sum								3.00E-03	3.59E-05

Stream Sediment

Analyte	Max. Conc. (mg/kg)	Oral Slope Factor ¹	Oral RfD ¹	Cancer Intake Factor ²	Noncancer Intake Factor ²	Residential Dermal RBCs (mg/kg) ³		Ratio of Conc. to RBC	
						Cancer	Noncancer	Cancer	Noncancer
Benzoic Acid	0.17	-	4.00E+00	-	2.80E-07	-	1.43E+07	-	1.19E-08
Benzyl alcohol	0.041	-	3.00E-01	-	2.80E-07	-	1.07E+06	-	3.83E-08
bis(2-Ethylhexyl) phthalate	0.17	1.40E-02	2.00E-02	8.54E-08	2.80E-07	8.36E+02	7.14E+04	2.03E-04	2.38E-06
Di-n-butyl phthalate	0.045	-	1.00E-01	-	2.80E-07	-	1.65E+04	-	2.73E-06
Dermal Ratio Sum								6.20E-03	7.70E-05
Screen Ratio Sum								3.72E-03	3.36E-05
Total Ratio Sum								9.92E-03	1.11E-04

¹ DOE 1995b. Units of slope factors are risk per mg chemical/kg body weight-day; units of reference dose (RfDs) are mg/chemical/kg body weight-day. Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

² Intakes were calculated using assumptions and equation shown in the OU 6 Letter Report (DOE 1994). Units are kg soil/kg body weight-day.

³ Carcinogenic RBC = target risk/(intake factor x slope factor); noncarcinogenic RBC = (target hazard index x RfD)/intake factor.

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk-based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6, Rocky Flats Environmental Technology Site, Golden, CO, October.*

DOE, 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6 (Draft), Rocky Flats Environmental Technology Site, Golden, CO, September.*

DOE, 1995b, *Programmatic Risk-based Preliminary Remediation Goals, Final Revision 3, Rocky Flats Environmental Technology Site, Golden, CO, August.*

Rocky Mountain Remediation Services (RMRS), 1996, *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site, Rocky Flats Cleanup Agreement, Final, July 19, 1996, Golden, CO.*

PAC REFERENCE NUMBER(S): NE-166.1, NE-166.2 & NE-166.3

IHSS Reference Number: 166.1, 166.2 & 166.3, Operable Unit 6

Unit Name: Trenches South of the Present Landfill (IHSS Name: Trenches A, B, and C; Trench C consists of two smaller trenches)

Approximate Location: N752,000; E2,084,000

Date(s) of Operation or Occurrence

Prior to 1964 and also 1970 (see discussion below for explanation)

Description of Operation or Occurrence

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), conflicting information has been found regarding the description of the operation or occurrence. Listed below are four explanations for the existence of these trenches.

1. According to one reference, these trenches received a few hundred gallons of liquid from the RFP sanitary waste-water treatment plant (Building 995) in 1970 (DOE, 1992). A map with that reference indicates only one trench in the area.
2. RCRA 3004(u) states that sludge from Building 995 was disposed of in two trenches and possibly in a third trench near the landfill. This sludge was generated during a period of high sewage sludge output from Building 995, but no other time frame for these activities is given.
3. A brief discussion of possible sludge disposal "out north of the plant" is found. This document also discusses sludge disposal by Austin (a construction firm) to the north of the plant. The source of this waste was the number 1 digester at Building 995 (DOE, 1992).
4. Another reference states that the sanitary sewage sludge that was disposed of in this area was simply pumped on the ground and the area never actually trenched (DOE, 1992).

Photographs of the RFP do not indicate any disturbances in the location of these trenches in 1955, but in 1964, disturbed areas corresponding to these three trenches are visible. The disturbed areas do not show significant change in 1971 or in any other photographs taken after 1964.

Physical/Chemical Description of Constituents Released

The material reported to be placed in this unit consisted of sanitary waste-water treatment plant sludge. Older sludge (prior to 1957) would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination during and after 1957. Total long-lived alpha activity present in the sludge has been reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960 (DOE, 1992). Analysis of soil samples collected during exploratory drilling did not indicate the presence of any radioactivity.

Prior to the issuance of the HRR (DOE, 1992), a number of documents were located that make reference to analytical data indicating that uranium, 2-butanol, 1,1,1-TCA, TCE, and toluene were detected in Trench A soil. A search for the data was made, but nothing found.

Response to Operation or Occurrence

Soil sampling at these trenches in the late 1970s or early 1980s did not reveal any radioactivity. In 1991, Trenches A, B, and C were included in the IAG as IHSSs 166.1, 166.2, and 166.3, respectively, and slated for further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992-1993) 26 soil borings were drilled to a depth of 5 feet below the bottom of each trench. Eight borings were drilled in Trench A, seven in Trench B, six in Trench C west, and five in Trench C east. Soil samples were analyzed for VOCs, metals, and radionuclides. In addition, five existing monitoring wells, located in the vicinity of these trenches, were sampled. Groundwater samples were analyzed for VOCs, semi-VOCs, pesticides/PCBs, metals, and gross alpha and beta.

Fate of Constituents Released to the Environment

The results of the CDPHE conservative screen on the soil samples collected from IHSSs 166.1, 166.2, and 166.3, as reported in the final OU 6 Letter Report (DOE, 1994), indicate that any constituents released to the environment from the soil present negligible risk to human health and the environment. The background comparison conducted as part of the conservative screen resulted in the inorganic and radionuclide PCOCs shown in Table 1. All organic constituents detected in the soil samples are considered PCOCs and are also listed in Table 1.

The results of the CDPHE conservative screen on the groundwater samples collected from the five nearby monitoring wells (DOE, 1994) suggest that residential exposure to groundwater in the vicinity of the IHSSs could be a threat to human health. Table 2 lists the carcinogenic ratio sum as 1.95×10^3 and the non-carcinogenic ratio sum as 7.50×10^1 . These ratio sums differ somewhat from those reported in the final OU 6 Letter Report for the following reasons:

- Only data from the five nearby monitoring wells were used in Table 2; the final OU 6 Letter Report uses data from all wells within the drainage basin of No Name Gulch (the unnamed northern tributary to Walnut Creek). These data were obtained from Section 4.0, Nature and Extent of Contamination, of the OU 6 RFI/RI report (DOE, 1995a).

The Risk Based Concentrations (RBCs) used in Table 2 were taken from the August 1995 *Programmatic Risk-based Preliminary Remediation Goals* (DOE 1995b), which includes the most recent toxicity and exposure factors.

Table 1. RBC¹ Screen for IHSSs 166.1-166.3 (Trenches) – Soils 1 to 12 Feet

Analyte ²	Maximum Concentration or Activity	Depth of Sample (in ft)	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Organics (mg/kg):						
Acetone ³	0.02	7 - 8	-	2.74E+04	-	7.30E-07
Benzene	0.006	8 - 9	2.21E+01	-	2.71E-04	-
2-Butanone	1.6	4 - 5	-	1.65E+05	-	9.70E-06
Chloroform	0.002	7 - 8	1.05E+02	2.74E+03	1.90E-05	7.30E-07
4-Methyl-2-pentanone	0.002	11 - 12	-	2.20E+04	-	9.09E-08
Methylene chloride ³	0.054	7 - 8	8.54E+01	1.65E+04	6.32E-04	3.27E-06
Styrene	0.001	7 - 8	-	5.49E+04	-	1.82E-08
Trichloroethene	0.021	7 - 9	5.82E+01	-	3.61E-04	-
Toluene	0.59	0 - 1	-	5.49E+04	-	1.07E-05
Inorganics (mg/kg):						
Barium	2970	6 - 12	-	1.92E+04	-	1.55E-01
Chromium	130	6 - 12	-	2.74E+05	-	4.74E-04
Strontium	264	0 - 6	-	1.65E+05	-	1.60E-03
Radionuclides⁴ (pCi/g):						
Americium-241	0.0229	11 - 12	1.90E+00	-	1.21E-02	-
Plutonium-239/240	0.0855	11 - 12	2.51E+00	-	3.41E-02	-
Uranium-235	0.13	0 - 6	1.56E-01	-	8.33E-01	-
Ratio Sum					8.81E-01	1.57E-01

¹ RBC = Risk-based concentration; chemical-specific RBCs are presented in the Programmatic Risk-based Preliminary Remediation Goals (DOE 1995b). The RBCs used in this conservative screen were based on a residential scenario for exposure to soil.

² Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed.

³ Maximum concentrations of acetone and methylene chloride differ from those reported in the Letter Report. Subsequent comparison to laboratory blank data indicated that much of their presence in subsurface soils at these IHSSs were due to laboratory contamination. Only those values greater than 10 times the concentration detected in laboratory blanks were retained as valid data (DOE 1995a).

⁴ For radionuclides listed with more than one isotope, the more conservative RBC was used.

Trenches A, B, and C do not appear to be the source of groundwater contamination in the nearby wells. The metals detected in unfiltered groundwater samples are probably naturally occurring and are likely associated with elevated TSS in the groundwater samples. Elevated levels of TSS can occur when there is insufficient groundwater (within the monitoring well) to permit adequate well development prior to sampling. An example of this is well No. 7287, which shows maximum concentrations for total metals (except for selenium) detected in the same sample and

also has the highest concentration of TSS (17,000 mg/l) compared to the second highest concentration of 9,382 mg/l). The only dissolved metals detected in this well above the background mean plus two standard deviations were zinc and copper.

Table 2. RBC¹ Screen for IHSSs 166.1-166.3 (Trenches) - Unfiltered Groundwater

Analyte ²	Maximum Concentration or Activity ³	Well ID	Residential Groundwater RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Organics (mg/l):						
1,1,1-Trichloroethane	0.007	7287	-	-	-	-
1,1-Dichloroethane	0.005	B206489	-	1.01E+00	-	4.95E-03
1,2-Dichloroethene	0.006	7287	-	3.29E-01	-	1.82E-02
Acetone	0.017	7087	-	3.65E+00	-	4.66E-03
Benzene	0.002	B206489	6.17E-04	-	3.24E+00	-
Carbon disulfide	0.004	7087	-	2.76E-02	-	1.45E-01
Carbon tetrachloride	0.008	7287	2.60E-04	2.55E-02	3.08E+01	3.14E-01
Chloroform	0.008	7287	2.76E-04	3.65E-01	2.90E+01	2.19E-02
Ethylbenzene	0.0007	B206489	-	1.58E+00	-	4.43E-04
Methylene chloride	0.003	7087	6.22E-03	1.73E+00	4.82E-01	1.73E-03
Tetrachloroethene	0.013	7287	1.43E-03	3.65E-01	9.09E+00	3.56E-02
Toluene	0.008	B206489	-	9.65E-01	-	8.29E-03
Total xylenes	0.004	B206489	-	7.30E+01	-	5.48E-05
Trichloroethene	0.15	7287	2.55E-03	-	5.88E+01	-
					1.31E+02	5.55E-01
Total Metals (mg/l):						
Aluminum	456	7287	-	1.02E+02	-	4.47E+00
Antimony	0.0614	7287	-	1.46E-02	-	4.21E+00
Arsenic	0.0099	7287	4.86E-05	1.09E-02	2.04E+02	9.08E-01
Barium	5.06	7287	-	2.56E+00	-	1.98E+00
Beryllium	0.032	7287	1.98E-05	1.82E-01	1.62E+03	1.76E-01
Cadmium	0.019	7287	-	1.83E-02	-	1.04E+00
Chromium	0.58	7287	-	3.65E+00	-	1.59E-01
Cobalt	0.228	7287	-	2.19E+00	-	1.04E-01
Copper	6.43	7287	-	1.46E+00	-	4.40E+00
Lead	0.193	7287	-	-	-	-
Lithium	0.266	7287	-	-	-	-
Manganese	6.2	7287	-	1.83E-01	-	3.39E+01
Mercury	0.0014	7287	-	1.10E-02	-	1.27E-01
Nickel	1.07	7287	-	7.30E-01	-	1.47E+00
Selenium	0.22	B206689	-	1.83E-01	-	1.20E+00
Silver	3.04	7287	-	1.83E-01	-	1.66E+01
Strontium	1.74	7287	-	2.19E+01	-	7.95E-02
Vanadium	0.754	7287	-	2.56E-01	-	2.95E+00
Zinc	8	7287	-	1.10E+01	-	7.27E-01
					1.82E+03	7.45E+01
Radionuclides (pCi/l):						
Cesium-137	1.063	7287	1.51E+00	-	7.04E-01	-
Ratio Sum					1.95E+03	7.50E+01

¹ RBC = Risk-based concentration; chemical-specific RBCs are presented in the Programmatic Risk-based Preliminary Remediation Goals (DOE 1995b). The RBCs used in this conservative screen were based on a residential scenario for exposure to groundwater.

² Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed.

³ Data obtained from OU 6 RFI/RI report (DOE1995a).

The trenches also do not appear to be the source of organic contaminants in the local groundwater because the low concentrations of most chlorinated solvents in soil are not likely to have measurable effects on groundwater. Furthermore, the soil samples exhibiting chlorinated solvent concentrations were collected below the water table in French A borings, suggesting groundwater as the source of contaminants in those samples. The nearby landfill (IHSS 114) is a more probable source for this groundwater contamination. The OU 6 Letter Report provides detailed evidence to support this conclusion.

Action/No Action Recommendation

In accordance with the NFA decision criteria developed mutually by DOE, EPA, CDPHE, Kaiser-Hill, and RMRS (RMRS, 1996), any geographic area that passes the CDPHE conservative screen is a candidate for NFA. Passing the conservative screen requires a carcinogenic and non-carcinogenic risk ratio sum of below 1 each. As seen in Table 1, the carcinogenic ratio sum for soils is 8.81×10^{-1} and the non-carcinogenic ratio sum for soils is 1.57×10^{-1} ; both of these values are below 1. IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure (Table 3). The carcinogenic and non-carcinogenic risk ratio sums for methylene chloride and barium are 3.46×10^{-5} and 1.19×10^{-3} , respectively. These two constituents were selected for dermal assessment because they were the largest contributors to the ratio sum shown in Table 1. Tables 1 and 3 indicate that the risk to human health from exposure to soil at IHSS 166.1, 166.2 & 166.3 is minimal, based on the exposure assumptions for the residential scenario.

Table 3. RBC Screen for IHSSs 166.1, 166.2, and 166.3 – Dermal

Analyte ¹	Max. Conc. (mg/kg)	Oral Slope Factor ²	Oral RfD ²	Cancer Intake Factor ³	Noncancer Intake Factor ³	Residential Dermal RBCs (mg/kg) ⁴		Ratio of Conc. to RBC	
						Cancer	Noncancer	Cancer	Noncancer
Methylene chloride	0.054	7.50E-03	6.00E-02	8.54E-08	2.80E-07	1.56E+03	2.14E+05	3.46E-05	2.52336E-07
Barium	2970	-	7.00E-02	8.54E-09	2.80E-08	-	2.50E+06	-	1.19E-03
						Ratio Sum		3.46E-05	1.19E-03

¹ Analytes that were the largest contributors to the ratio sum in Table 1 were selected for the dermal exposure comparison. Radionuclides are not evaluated because they have small dermal permeability constants.

² Units of slope factors are risk per mg chemical/kg body weight-day; units of reference doses (RfDs) are mg/chemical/kg body weight-day. Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

³ Calculated using assumptions and equations presented in the OU 6 Letter Report (DOE 1994). Units are kg soil/kg body weight-day.

⁴ Carcinogenic RBC = target risk/(intake factor x slope factor); noncarcinogenic RBC = (target hazard index x reference dose)/intake factor.

The NFA decision criteria (RMRS 1996) states that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA process. Results of the *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site*, which appears as Appendix F in the OU 6 RFI/RI (DOE, 1995a), were used to determine the potential ecological threat from exposure to soil constituents at IHSSs 166.1, 166.2 & 166.3. According to the ERA, there is no apparent risk to the environment based on chemical concentrations detected from these IHSSs. The initial ERA screen revealed that the only potential ecological risk is to vegetation from exposure to strontium in subsurface soils. However, because the resulting hazard quotient of 1.5 is close to 1 and there are no signs of stressed vegetation in this area, it was determined that there was no threat to the environment from constituents detected at IHSSs 166.1, 166.2 or 166.3.

Based on the above evidence, the NFA decision criteria are met and no further action is warranted for the soils at IHSSs 166.1, 166.2, and 166.3, (Trenches A, B, and C).

Comments

This update to the HRR does not include a No Action recommendation for groundwater. The groundwater in the vicinity of this IHSS is being examined further in the IM/IRA process for OU 7 and will also be addressed through the Sitewide Groundwater Conceptual Plan.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June.

DOE, 1994, *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk-based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6*, Rocky Flats Environmental Technology Site, Golden, CO, October.

DOE, 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6*, Rocky Flats Environmental Technology Site, Golden, CO, September.

DOE, 1995b. *Programmatic Risk-based Preliminary Remediation Goals, Final Revision 3*, Rocky Flats Environmental Technology Site, Golden, CO, August.

RMRS, 1996, *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site*, IN: Rocky Flats Cleanup Agreement, Final, July 19, 1996, Golden, CO.

PAC REFERENCE NUMBER: NE-167.2 & NE-167.3

IHSS Reference Number: 167.2 and 167.3, Operable Unit 7

Unit Name: Landfill Pond Center and South Area Spray Fields

Approximate Location: N748,000; E2,075,900

Date(s) of Operation or Occurrence

1975 - 1994

Description of Operation or Occurrence

Spray evaporation of water from the East Landfill Pond began in September 1975 and was discontinued in 1994. During that time, approximately 5,500,000 gallons of water was stored to maintain a 75% capacity for the pond. Two discrete spray areas have been identified adjacent to the landfill pond; IHSS 167.2 on the north bank and IHSS 167.3 on the south bank. These IHSSs were originally part of Operable Unit 6 but were transferred to Operable Unit 7 in 1994 (DOE, 1994). Dimensions of the spray fields are approximately 100 x 460 ft. for IHSS 167.2 and 120 x 440 ft. for IHSS 167.3. Surface soils in spray evaporation areas were potentially contaminated by the landfill pond water. Surface soils down-gradient of the East Landfill Pond dam are considered downwind and also potentially contaminated by spray activities (DOE, 1992a).

Physical/Chemical Description of Constituents Released

The water sprayed onto the North and South Area Spray Fields may have been contaminated with varying amounts of low-level radioactivity derived from tritium, strontium, plutonium, and americium (DOE, 1992a). Low concentrations of phenol and nitrate were also detected in the spray water.

Response to Operation or Occurrence

The South Area Spray Field was included in the IAG as IHSS 167.3 and slated for further study as part of the OU-6 RFI/RI. The original location of the South Area Spray Field, as described in the IAG and the OU-6 Work Plan (DOE, 1992b), was south of the OU 7 Landfill on the plateau between an unnamed tributary and North Walnut Creek. During the OU 6 characterization activities, it was determined that the South Area Spray Field was actually located further north, adjacent to the south bank of the east landfill pond. The location of IHSS 167.3 was officially revised in the HRR (DOE, 1992a), based on reevaluation of aerial photographs and other historical records of waste disposal practices (DOE, 1995).

Surface soil samples were collected on a grid from the landfill eastward across the spray evaporation areas and surrounding slopes downwind below the dam. Soil samples were

collected at 133 locations from the 0 - 2 in. soil horizon during the OU-7 Phase I RFI/RI and 12 additional samples were collected from the 0 - 2 in. soil horizon during the supplemental Phase I field investigation. All samples were analyzed for metals, radionuclides, and indicator parameters.

Background comparisons were performed to identify PCOCs using the Gilbert methodology (EG&G, 1994). Analytes that were detected at concentrations or activities above background concentrations include metals, radionuclides, and indicator parameters. Additional information is provided in the OU 7 Final Work Plan (DOE, 1994). Arsenic was detected in all samples and was frequently detected above background. The maximum concentration of arsenic is 16 ppm at one location southwest of the IHSS 167.3. The maximum activity of americium-241 is 1 picocurie per gram (pCi/g) at a location on the hill-slope south of the pond. This area was regraded during routine maintenance at the landfill in September 1993, and falls under the proposed footprint of the landfill cap. The maximum activity of radium-226 is 2 pCi/g at a location downwind of the spray evaporation areas below the dam. Radium was not detected in confirmation samples collected during the supplemental Phase I fieldwork. Professional judgment was used to further review certain analytes after the statistical comparisons were completed. For example, calcium, iron, magnesium, potassium, and sodium were not considered to be PCOCs because they are essential nutrients (EPA, 1989). The following analytes are identified as PCOCs for surface soils in the vicinity of the East Landfill Pond (mean concentrations):

<u>Metals</u>	<u>Radionuclides</u>	<u>Indicator Parameters</u>
Antimony (4 ppm)	Americium-241 (.03 pCi/g)	Nitrate/nitrite (5 ppm)
Barium (190 ppm)	Plutonium-239/240 (.06 pCi/g)	
Copper (19 ppm)	Radium-226 (1 pCi/g)	
Lead (26 ppm)		
Mercury (.1 ppm)		
Selenium (1 ppm)		
Silver (1 ppm)		
Strontium (53 ppm)		
Thallium (.2 ppm)		
Vanadium (31 ppm)		
Zinc (56 ppm)		

Fate of Constituents Released to the Environment

No other documentation could be found which details the fate of constituents released to the environment.

Action/No Action Recommendation

Cancer slope factors and chronic reference doses used in risk calculations were taken from the Integrated Risk Information System (IRIS) (EPA, 1995a) and Health Effects Assessment Summary Tables (HEAST) (EPA, 1995b). Carcinogenic risk is below the EPA acceptable

risk range for incidental ingestion of non-radionuclides, incidental ingestion of radionuclides, particulate inhalation, and external irradiation. Non-carcinogenic risk (hazard index) is below 1 for incidental ingestion by a child (HI=0.004) and incidental ingestion by an adult (HI=0.0005). These results indicate that there is negligible risk to human health from exposure to surface soils down-gradient of the landfill for an open space receptor and that the requirements to support a No Action or No Further Action (as defined by CERCLA) remedy have been met.

Comments

None.

References

EPA, 1989, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A) (Interim Final)*, Office of Emergency and Remedial Response, EPA/540/1-89/002, Washington, D.C., December.

DOE, 1992a, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1992b, *Phase I RFI/RI Work Plan for Operable Unit 6-Walnut Creek Priority Drainage*, Manual No. 21100-WP-OU 6.01, U.S. Department of Energy, Rocky Flats Plant, Golden, Colorado, June.

EG&G, 1994, *Statistical Comparisons of Site-to-Background Data in Support of RFI/RI Investigations*, Rocky Flats Plant Guidance Document, Draft B, EG&G Rocky Flats, Inc., Golden, Colorado, January.

DOE, 1994, *Final Work Plan Technical Memorandum for Operable Unit No. 7 - Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS 203)*, U.S. Department of Energy, Rocky Flats Site, Golden, Colorado, September.

DOE, 1995, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6 (Draft)*, Rocky Flats Environmental Technology Site, Golden, CO, September.

EPA, 1995a, *Integrated Risk Information System (IRIS)*.

EPA, 1995b, *Health Effects Assessment Summary Tables (HEAST), FY 1995 Annual*, Office of Solid Waste and Emergency Response, EPA/504/R-95/036, May.

PAC REFERENCE NUMBER: NE-216.1

IHSS Reference Number: 216.1 in Operable Unit 6

Unit Name: East Spray Field, North Area

Approximate Location: N750,000; E2,089,000

Date(s) of Operation or Occurrence

Spring of 1989

Description of Operation or Occurrence

The north area (PAC NE-216.1) of the East Spray Field was opened in 1989 because of excessive runoff from the existing east spray fields. The area was closed shortly after opening due to excessive runoff from a new spray field located on the top of a hill between the A-Series and B-Series drainages, east of the protected area fence.

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), on February 22, 1989, a chromic acid spill occurred in Building 444. This chromic acid was inadvertently pumped to the sanitary sewer system. Eventually, it was estimated that 4.7 pounds of chromium were discharged to Pond B-3. The water from this pond was then spray irrigated on the north (and south) portions of the East Spray Field. Some of the runoff from the north portion of the East Spray Field was collected in Pond B-5. This incident required the submittal of a RCRA Contingency Plan Implementation Report (Number 89-001).

Physical/Chemical Description of Constituents Released

During its short operational period, the north area of the East Spray Field received water from Pond B-3, which received treated sanitary effluent from the onsite sewage treatment facility, including the chromic acid inadvertently released to the sanitary waste water.

Response to Operation or Occurrence

In response to the application of water potentially contaminated with chromium to the north (and south) portions of the East Spray Field, soil samples were collected from the spray fields and analyzed for total chromium using the EPA Extraction Procedure (EP) Toxicity test in order to measure the amount of chromium that is leachable from the soil. The EP Toxicity chromium analyses of these soil samples indicated that background soil concentrations of leachable chromium varied from <0.010 to 0.023 mg/l, whereas the spray field soils had leachable chromium concentrations of <0.010 to 0.082 mg/l.

The north area of the East Spray Field was included in the IAG as IHSS 216.1 and slated for

further study as part of the OU 6 RFI/RI. During the OU 6 field investigation (1992-1993) six surface soil samples were collected and analyzed for metals, radionuclides, and TOC. In addition, six soil borings were drilled to a depth of 4 feet and sampled in 2-foot intervals. Samples were analyzed for VOCs, metals, radionuclides, and TOC. IHSS 216.1 lies in an unsaturated zone between the two drainages; therefore, no groundwater was available for sampling.

Fate of Constituents Released to the Environment

The results of the CDPHE conservative screen for IHSS 216.1, as reported in the final OU 6 Letter Report (DOE, 1994), indicate that any constituents released to the environment present negligible risk to human health and the environment. The background comparison conducted as part of the conservative screen resulted in the inorganic and radionuclide PCOCs shown in Table 1. All organic chemicals detected in the soil samples are considered PCOCs and are also listed in Table 1.

Action/No Action Recommendation

In accordance with the NFA decision criteria developed mutually by DOE, EPA, CDPHE, Kaiser-Hill, and RMRS (RMRS, 1996), any geographic area that passes the CDPHE conservative screen is a candidate for NFA. Passing the conservative screen requires a carcinogenic and non-carcinogenic risk ratio sum of below 1 each. As seen in Table 1, the carcinogenic ratio sum is 4.4×10^{-1} and the non-carcinogenic ratio sum is 4.4×10^{-2} . Both of these values are below 1. These ratios differ somewhat from those presented in the OU 6 Letter Report because methylene chloride was determined to be a laboratory contaminant and was omitted from the data set (DOE, 1995a). IHSSs that pass this initial portion of the CDPHE conservative screen must also be assessed for risk due to dermal exposure (Table 2). The non-carcinogenic risk ratio sum for barium and strontium is 3.4×10^{-4} . These two constituents were selected for dermal assessment because they were the largest contributors to the ratio sum shown in Table 1. Tables 1 and 2 indicate that the risk to human health from exposure to soil at IHSS 216.1 would be minimal, based on the exposure assumptions for the residential scenario.

The NFA decision criteria (RMRS 1996) states that a geographic area that passes the CDPHE conservative screen must also undergo an ERA before it can proceed through the NFA process. Results of the draft *Ecological Risk Assessment for Walnut Creek and Woman Creek Watersheds at Rocky Flats Environmental Technology Site*, which appears as Appendix F in the OU 6 RFI/RI report (DOE, 1995a), were used to determine the potential ecological threat from exposure to soil constituents at IHSS 216.1. According to the ERA, there is little risk to the environment based on chemical concentrations detected in IHSS 216.1. The initial concern in this area, which also includes the soil dump and triangle areas, was the consumption of mercury in soil by small mammals that would in turn be consumed by the American kestrel and other terrestrial-feeding raptors. However, the detection frequencies in mercury were so low in the soil samples collected from this area that mercury was dropped from further consideration. Therefore, it appears from the ERA that the ecological risk from exposure to soil in IHSS 216.1 would be minimal.

Table 1. RBC¹ Screen for IHSS 216.1 (East Spray Field) -- Soils 1 to 12 Feet

Analyte ²	Maximum Concentration or Activity	Depth of Sample (in ft)	Residential Soil RBCs		Ratio of Concentration to RBC	
			Carcinogenic	Noncarcinogenic	Carcinogenic	Noncarcinogenic
Organics ³ (mg/kg):						
Acetone	5.1	1 - 2	-	2.74E+04	-	1.86E-04
2-Butanone	3.7	1 - 2	-	1.65E+05	-	2.24E-05
Toluene	0.63	1 - 2	-	5.49E+04	-	1.15E-05
Inorganics (mg/kg):						
Barium	783	0 - 2	-	1.92E+04	-	4.08E-02
Lead ⁴	57.1	0	-	-	-	-
Strontium	506	2 - 4	-	1.65E+05	-	3.07E-03
Radionuclides ⁵ (pCi/g):						
Americium-241	0.192	0	1.90E+00	-	1.01E-01	-
Plutonium-239/240	0.758	0	2.51E+00	-	3.02E-01	-
Ratio Sum					4.03E-01	4.41E-02

¹ RBC = Risk-based concentration; chemical-specific RBCs are presented in the Programmatic Risk-based Preliminary Remediation Goals (DOE 1995b). The RBCs used in this conservative screen were based on a residential scenario for exposure to soil.

² Only metals and radionuclides with concentrations or activities greater than background mean plus 2 standard deviations are listed.

³ Methylene chloride was originally included in the RBC screen; however, subsequent comparison to laboratory blank data indicated that its presence in subsurface soil was due to laboratory contamination (DOE 1995a).

⁴ Although no toxicity values exist for lead in soil, the maximum lead concentration of 57.1 mg/kg is well below EPA's screening level of 400 mg/kg for residential soil (EPA 1994).

⁵ For radionuclides listed with more than one isotope, the more conservative RBC was used.

Table 2. RBC for IHSS 216.1 -- Dermal

Analyte ¹	Max. Conc. (mg/kg)	Oral Slope Factor ²	Oral RfD ²	Cancer Intake Factor ³	Noncancer Intake Factor ³	Residential Dermal RBCs (mg/kg) ⁴		Ratio of Conc. to RBC	
						Cancer	Noncancer	Cancer	Noncancer
Barium	783	-	7.00E-02	-	2.80E-08	-	2.50E+06	-	3.13E-04
Strontium	506	-	6.00E-01	-	2.80E-08	-	2.14E+07	-	2.36E-05
						Ratio Sum		-	3.37E-04

¹ Analytes that were the largest contributors to the ratio sum in Table 1 were selected for the dermal exposure comparison. Radionuclides are not evaluated because they have small dermal permeability constants.

² Units of slope factors are risk per mg chemical/kg body weight-day; units of reference doses (RfDs) are mg/chemical/kg body weight-day. Oral toxicity criteria were not adjusted for absorption or other corrections applicable to dermal contact.

³ Calculated using assumptions and equation presented in the OU 6 Letter Report (DOE 1994). Units are kg soil/kg body weight-day.

⁴ Carcinogenic RBC = target risk/(intake factor x slope factor); noncarcinogenic RBC = (target hazard index x reference dose)/intake factor.

Based on the above evidence, the NFA decision criteria are met and No Action is warranted for IHSS 216.1, north area of the East Spray Field.

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June.

DOE, 1994, *Letter Report on the Colorado Department of Public Health and Environment Source Area Delineation and Risk-based Conservative Screen and the Environmental Protection Agency Areas of Concern Delineation for the Human Health Risk Assessment, Walnut Creek Priority Drainage, Operable Unit No. 6*, Rocky Flats Environmental Technology Site, Golden, CO, October.

DOE, 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6*, Rocky Flats Environmental Technology Site, Golden, CO, September.

DOE, 1995a, *Phase I RFI/RI Report on the Walnut Creek Priority Drainage, Operable Unit No. 6*, Rocky Flats Environmental Technology Site, Golden, CO, September.

DOE, 1985b, *Programmatic Risk-based Preliminary Remediation Goals, Final Revision 3*, Rocky Flats Environmental Technology Site, Golden, CO, August.

EPA, 1994, *Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities*, OSWER Directive No. 9355.4-12, Washington, D.C., July.

RMRS, 1996, *No Action/No Further Action/No Further Remedial Action (NFA) Decision Criteria for Rocky Flats Environmental Technology Site*, IN: Rocky Flats Cleanup Agreement, Final, July 19, 1996, Golden, CO.

PAC REFERENCE NUMBER: NW-195

IHSS Reference Number: 195, Operable Unit 16

Unit Name: Nickel Carbonyl Disposal

Approximate Location: N754,500; E2,083,000

Date(s) of Operation or Occurrence

March through August 1972

Description of Operation or Occurrence

From March through August 1972, cylinders of nickel carbonyl were disposed of in a dry well located in the buffer zone. The cylinders were opened inside the well and vented with small arms fire to allow decomposition in air (DOE, 1994).

Physical/Chemical Description of Constituents Released

Nickel carbonyl vapors are denser than air. Consequently, the vapors collected and decomposed in the bottom of the well. Because these vapors ignite spontaneously, ignition occurred either immediately after release into the well or sometime after collection at the bottom of the well (DOE, 1992a, 1992b).

Response to Operation or Occurrence

After 24 hours of placement in the well, the cylinders were removed from the hole, vented by small arms fire, and buried in the Present Landfill. Two cylinders became stuck in the hole and were buried in place. A minimal amount of nickel carbonyl was probably released to the atmosphere during disposal. Samples (presumably of air) from the lip of the well taken after the initial disposal indicated nickel carbonyl concentrations of approximately 10 parts per million being released during disposal (DOE, 1992a, 1992b). This IHSS was then studied in accordance with the IAG as part of OU 16 (DOE, 1992b).

Fate of Constituents Released to the Environment

Nickel carbonyl is highly volatile and readily decomposes in the presence of oxygen, forming nickel oxide. Nickel oxide is highly insoluble in groundwater. For every gram (0.002 pound) of nickel oxide in contact with typical groundwater, approximately 10 micrograms of nickel per liter of groundwater is transferred into solution. Wind dispersion subsequently disseminated the nickel oxide particles, which therefore would not be detected at concentrations exceeding background. IHSS 195 does not pose a risk to human health and the environment because there are no viable transport pathways.

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), a CAD/ROD recommending No Action under CERCLA for IHSS 195 was approved on October 28, 1994 (see declaration next page).

Comments

None.

References

DOE, 1992a, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1992b, *Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Corrective Action Decision/Record of Decision for OU16: Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Plant Operable Unit 16: Low Priority Sites
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

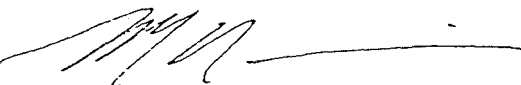
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16: Low Priority Sites, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy: No Action

OU16: Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a "No Action" remedy for five of the IHSSs (i.e., 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final "No Further Action Justification" document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

Declaration Statement

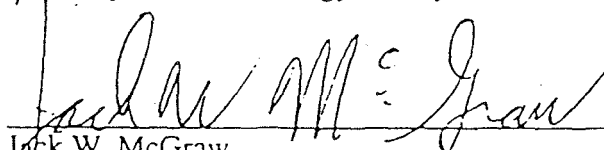
DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16: Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health-based levels, a five-year review is not required.



Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/24/94

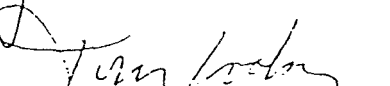
Date



Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

10/28/94

Date

PAC REFERENCE NUMBER: NW-203

IHSS Reference Number: 203, Operable Unit 7

Unit Name: Inactive Hazardous Waste Storage Area

Approximate Location: N752,000; E2,082,500

Date(s) of Operation or Occurrence:

1986-1987

Description of Operation or Occurrence

An area in the southwestern portion of the Present Landfill (PAC NW-114) was operated as a hazardous waste storage area for both drummed liquid and solid waste. All containers with free liquids were stored within two 40-ft cargo containers with interior secondary containment. Some drums containing only solid waste were stored outside. At maximum capacity, the area consisted of eight 20-ft cargo containers and six 40-ft cargo containers. A total of 384 55-gallon drums could be stored. Two of the containers were used to store polychlorinated biphenyl (PCB) contaminated soil, debris, and transformer oil (DOE, 1991).

As stated in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), an incident occurred on June 11, 1987, in which a drum of epoxy chemicals was found to be overheated. The overheating was caused by an exothermic reaction during the formation of epoxy. No release to the environment occurred because of the incident. A small spill (less than 4 fluid ounces) from a leaking drum was discovered in a cargo container June 21, 1988. The material had traces of PCBs.

The use of this area for the storage of hazardous waste was stopped due to its close proximity to RFP Operations.

Physical/Chemical Description of Constituents Released

Miscellaneous solid and liquid hazardous non-radioactive wastes containing organic solvents and PCBs were stored at this site (DOE, 1991). Although controls meeting regulatory standards were implemented to prevent leaks and spills, spills of less than reportable quantities may have occurred from the drums during the transfer of materials into and out of drums. Analytical results of the materials stored in the area suggested that contamination may have been limited to metals, PCBs, and radionuclides sorbed to surficial soils and volatile organic compounds present at shallow depths in the surficial materials. The presence or absence of these constituents was not confirmed at the time (DOE 1991).

During a Site-wide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method

8080. Based on the analytical results, there were no detections of PCBs in the surficial soil samples, indicating that the spill which occurred on June 21, 1988, was adequately cleaned up.

Response to Operation or Occurrence

In response to the incident of the overheated drum in 1987, the Fire Department removed the drum to an open area to cool down. The drum was later opened by the Waste Management Group without further incident (DOE, 1992). The drum that leaked PCBs in 1988 was placed into an 83-gal overpack drum and the cleanup debris was placed in a waste drum.

Fate of Constituents Released to Environment

Surface soil samples were collected at 49 locations from the 0- to 2-inch soil horizon and at 18 locations from the 0- to 10-inch soil horizon. Samples were analyzed for PCBs, metals, and radionuclides. Two PCBs (Aroclor-1254 and Aroclor-1260) were detected at low concentrations in approximately 20 percent of the soil samples but are not present at depth. All but one of the results for the analysis of PCBs in soil from IHSS 203 were "J" qualified, denoting estimated PCB concentrations below the detection limit of 230 $\mu\text{g/kg}$ (DOE, 1994). The one sample not denoted as "J" qualified indicated PCB Aroclor 1254 at 9.9 - 100 ppb and Aroclor 1260 at 11 - 160 ppb ranges. Metals and radionuclides were generally detected at concentrations or activities less than the maximum background concentration or activity (DOE, 1996).

Action/No Action Recommendation

Although no action may be warranted at IHSS 203 as a result of any previous spills, this area will likely be capped as it overlies the Present Landfill (IHSS 114). The OU 7 IM/IRA Decision Document and Closure Plan (DOE, 1996) recommends that a single-barrier cover be placed over the Present Landfill (IHSS 114), Inactive Hazardous Waste Storage Area (IHSS 203), and asbestos-disposal areas.

Comments

This area was identified as Unit #1 in the November 1986 RCRA Part B Permit Application. In 1988, Unit #1 was relocated to its present location in the 500 Area (PAC 500-903).

References

DOE, 1991, *Final Phase I RFI/RI Work Plan for Operable Unit No. 7, Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS 203)*, Rocky Flats Plant, Golden, CO, December.

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1994, *Technical Memorandum/Final Phase I RFI/RI Work Plan for Operable Unit No. 7, Present Landfill (IHSS 114) and Inactive Hazardous Waste Storage Area (IHSS 203)*, Rocky Flats Plant, Golden, CO, December.

DOE, 1996, *Phase I IM/KA Decision Document and Closure Plan for Operable Unit 7, Present Landfill (Revised Draft Report)*, Rocky Flats Environmental Technology Site, Golden, CO, March.

PAC REFERENCE NUMBER: 000-168

IHSS Reference Number: 168, Operable Unit 11

Unit Name: West Spray Field

Approximate Location: N749,000; E2,078,000

Date(s) of Operation or Occurrence

April 1982 through October 1985

Description of Operation or Occurrence

The West Spray Field was used for the periodic spray application of excess water pumped from Solar Evaporation Ponds 207-B North and 207-B Center. When the storage capacity of these ponds was reached, the liquids were pumped to the West Spray Field via an aboveground pipeline for spray application. The sources of waste water stored in the Solar Evaporation Ponds and sprayed at OU 11 included treated sanitary waste water from the Sewage Treatment Plant and groundwater collected in the interceptor trench system north of Building 771. Approximately 66 million gallons from the Solar Evaporation Ponds were sprayed at OU 11 (DOE, 1992).

Physical/Chemical Description of Constituents Released

The pond liquids applied to the West Spray Field contained high nitrate concentrations, elevated levels of radionuclides, trace levels of volatile and semi-volatile organic compounds, and metals (DOE, 1991a).

Response to Operation or Occurrence

A Comprehensive Environmental Assessment and Response Program initiated in 1986 identified IHSS 168 as a Solid Waste Management Unit (SWMU). IAG negotiations held in 1991 changed the designation from SWMU to IHSS and initiated the investigatory program for OU 11 to evaluate potential contamination within IHSS 168. The Final Phase I RFI/RI Work Plan (DOE, 1991b) was completed in 1992; the Final Combined Phases RFI/RI Report (DOE, 1995a) was completed in June 1995 and the CAD/ROD (DOE, 1995b) was approved in October 1995. IHSS 168 is classified as a low-hazard site, requiring No Action under a residential-use scenario.

Fate of Constituents Released to the Environment

Plutonium-239/240, americium-241, tritium, and nitrate/nitrite were the only constituents identified during the field sampling in 1994 and are considered potential chemicals of concern (PCOCs). Americium and plutonium, identified as PCOCs in surficial soils at OU 11, have

exhibited little migration since spray activities ceased in 1985. Most of the nitrate/nitrite appears to have been taken up as "fertilizer" by indigenous plants. Tritium, as tritiated water, would have behaved similarly to regular water but has not been detected at levels above background for OU 11 groundwater. Analysis of the fate and transport characteristics of the PCOCs does not indicate a potential for any changes to the current conditions. The potential for offsite migration of PCOCs appears to be extremely limited.

Action/No Action Recommendation

The CDPHE risk-based conservative screen was performed on the soil PCOCs, using OU 11 data from the surface to a depth of 12 feet. No PCOCs were identified in OU 11 groundwater samples. The total ratio sums for OU 11 are less than 1, indicating a low-hazard source area. An evaluation of dermal contact for PCOCs in OU 11 surficial soil confirms this assessment (DOE, 1995a). In addition, the screening-level ecological risk assessment concluded that past operations at OU 11 have had no significant adverse ecological effects. No negative effects to critical habitats, wetlands, or endangered species were identified. Trends in the ecological data are consistent with effects of supplemental watering and fertilizing in a semiarid grassland. While this may have caused effects to vegetation such as increased biomass and litter, the effects are not detrimental to the grassland ecosystem (DOE, 1995b). Based on information presented in the *Final OU 11 Combined Phases RFI/RI Report* (DOE, 1995a), a CAD/ROD recommending No Action under CERCLA and Clean Closure under RCRA was prepared (DOE, 1995b) and approved on September 21, 1995 (see declaration next page).

Comments

None.

References

DOE, 1991a, *Draft Phase I RFI/RI Work Plan for the Solar Ponds (OU 4)*, Rocky Flats Plant, Golden, CO, June.

DOE, 1991b, *Draft Phase I RFI/RI Work Plan for the West Spray Field (OU 11)*, Rocky Flats Plant, Golden, CO, June.

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Operable Unit 11 Final Combined Phases RFI/RI Report*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1995b, *Final Corrective Action Decision/Record of Decision for OU11: West Spray Field*, Rocky Flats Environmental Technology Site, Golden, CO, September.

CORRECTIVE ACTION DECISION/RECORD OF DECISION
DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site Operable Unit 11: West Spray Field, Jefferson County, Colorado

Statement of Basis and Purpose

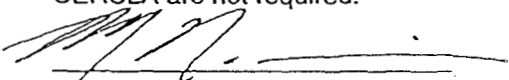
This decision document presents the selected remedial action/corrective action for the Rocky Flats Environmental Technology Site Operable Unit (OU) 11: West Spray Field, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU 11 was investigated and a remedial alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy

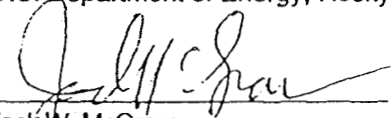
OU 11: West Spray Field is composed of one Individual Hazardous Substance Site (IHSS), IHSS 168. The preferred alternative for OU 11 consists of "No Action". The No Action decision for OU 11 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is in a protective state, i.e., poses no current or potential threat to human health or the environment. The risk evaluation performed in the RCRA Facilities Investigation/CERCLA Remedial Investigation (RFI/RI) Report determined that OU 11 was in a protective state.

Declaration Statement

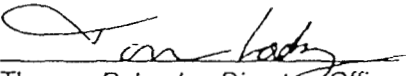
DOE has determined that no remedial action is necessary to be protective of human health and the environment at Rocky Flats Environmental Technology Site Operable Unit 11: West Spray Field. Because the remedy will not result in hazardous substances, pollutants, or contaminants remaining onsite above levels that allow for unlimited use and unrestricted exposure, five-year reviews per Section 121 of CERCLA are not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/5/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

PAC REFERENCE NUMBER: 000-192

IHSS Reference Number: 192, Operable Unit 16

Unit Name: Antifreeze Discharge

Approximate Location: N749,500; E2,084,000 (Building 708 floor drain)

Date(s) of Operation or Occurrence

December 2 or 3, 1980

Description of Operation or Occurrence

Approximately 155 gallons of antifreeze solution were discharged from the evaporator of a brine chiller into a floor drain in Building 708 (DOE, 1992a, 1992b). The floor drain discharged into a buried culvert south of the building. The buried culvert ran east from Building 708 under the Building 750 parking lot and terminated at an open culvert just east of Tenth Street. This storm-runoff collection system discharges from the culvert into South Walnut Creek.

Physical/Chemical Description of Constituents Released

The antifreeze solution contained 25 percent ethylene glycol in water (DOE, 1992a, 1992b).

Response to Operation or Occurrence

The flow was contained by diverting the storm water discharge into retention Pond B-1. The B-5 pond dam was closed and there was no offsite discharge of the liquid. Following the release, 5,000 gallons of water were flushed through the drainage system into Pond B-1. Based on visual observations of color and flow, it was believed that all of the spill was contained in Pond B-1. Follow-up samples were collected from several locations and analyzed (DOE, 1992a, 1992b). This IHSS was then studied in accordance with the IAG of 1991 as part of OU 16 (DOE, 1992b).

Fate of Constituents Released to the Environment

Although no direct documentation was found that detailed the fate of the ethylene glycol, it is highly unlikely that any of this chemical remains in the environment from this release. As described in the *Final No Further Action Justification Documentation for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), ethylene glycol (250,000 parts per million in antifreeze) would degrade to less than 7 parts per million in approximately 20 to 40 days at surface conditions. In addition, the degradation of ethylene glycol in multi-media environments was modeled and the results demonstrated that the concentration of ethylene glycol in leachate

would decrease to less than 1 part per billion in 4 days. Because the degradation models predicted that no ethylene glycol would be detected in leachate or soils less than one week following the spill, the source would have been completely degraded in the time elapsing since 1980. Without a source, there is no risk to human health or the environment (DOE, 1994).

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), a CAD/ROD recommending No Action under CERCLA for IHSS 192 was prepared and approved on October 28, 1994 (see declaration next page).

Comments

None.

References

DOE, 1992a, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1992b, *Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Corrective Action Decision/Record of Decision for OU16: Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Plant Operable Unit 16: Low Priority Sites
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

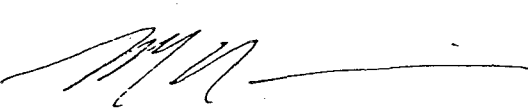
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16: Low Priority Sites, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy: No Action

OU16: Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a "No Action" remedy for five of the IHSSs (i.e., 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final "No Further Action Justification" document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

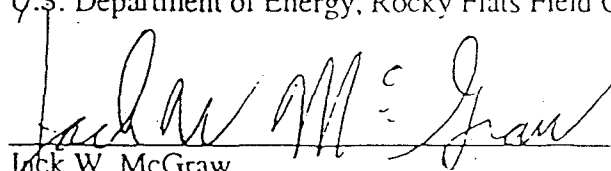
Declaration Statement

DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16: Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health-based levels, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

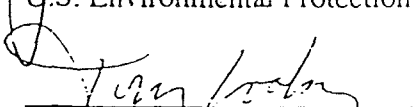
9/24/94

Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/29/94

Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

10/28/94

Date

PAC REFERENCE NUMBER: 348-708

IHSS Reference Number: Not Applicable

Unit Name: Transformers North of Building 371

Approximate Location: N750,500; E2,082,500

Date(s) of Operation or Occurrence:

Prior to August, 1991

Description of Operation or Occurrence

The following six transformers are located north of Building 371: 371-1, 371-2, 371-3, 371-4, 371-5, and 371-6. Transformers 371-7 and 371-8, located in Room 3581 of Building 371, are also included in this PAC, not to imply that they have leaked, but to provide additional information only. It was noted in one reference that an area outside of Room 3581 had the potential to be contaminated with PCBs due to a transformer spill or fire (DOE, 1992).

At the time the Historical Release Report was written, transformer 371-1 had staining on the pad beneath the drain valve, indicating leakage. The transformers are all located within a rock-filled berm.

Physical/Chemical Description of Constituents Released

The following shows PCB analytical results for 1985 and 1992 transformer oils (DOE, 1992):

<u>Transformer #</u>	<u>1985 Results</u>	<u>1992 Results</u>
371-1	2,244 ppm	20 ppm
371-2	20 ppm	19 ppm
371-3	58 ppm	4 ppm
371-4	1,799 ppm	18 ppm
371-5	952 ppm	12 ppm
371-6	1,026 ppm	13 ppm

Response to Operation or Occurrence

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using Clor-N-Soil PCB Screening Kits, which are based on a 50 ppm PCB standard. These analytical results indicated that three out of 20 samples indicated PCB levels > 50 ppm.

In 1995, under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), approximately 300 soil screening samples were collected to determine the presence or absence of PCB contamination in the soil and to

determine the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080.

In accordance with the PAM (DOE, 1995), approximately 2 cubic yards of PCB-contaminated soil were excavated on the north side of Transformer 371-2, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found which detailed the fate of constituents released to the environment.

Action/No Action Recommendation

Based on the 1995 final cleanup analytical results, PCB concentrations in the soil were less than 10 ppm using EPA Method 4020, and were below detection levels using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. PCB results for the concrete samples were less than 1.3 ppm. Thus, the 25 ppm PCB cleanup level (DOE, 1995) has been achieved at this PAC and no further action is warranted.

Comments

In accordance with the PAM (DOE, 1995), a project completion report will be prepared and submitted in 1996 to document field activities and analytical results.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER(S): 360-709

IHSS Reference Number: Not Applicable

Unit Name: Transformer Leak - 334-1

Approximate Location: N749,500; E2,082,500

Date(s) of Operation or Occurrence

1975 to 1986

Description of Operation or Occurrence

Transformer 334-1 is located on a concrete pad and surrounded by a concrete berm adjacent to the northwest side of Building 334. Plant utility records indicate the transformer has had several previous locations. This 500 KVA transformer was manufactured in 1975 (DOE, 1992).

Physical/Chemical Description of Constituents Released

As presented in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), in June 1986, Transformer 334-1, which contained 285 gallons of dielectric fluid, was reported as leaking. The transformer contained mineral oil with 772 ppm PCBs prior to being retrofilled in 1986.

Response to Operation or Occurrence

The dielectric fluid in Transformer 334-1 was flushed in 1986 (DOE, 1992).

During a sitewide sampling program in August 1991, soil samples were collected at this location in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080.

Fate of Constituents Released to Environment

No documentation was found that detailed the fate of constituents.

Action/No Action Recommendation

This PAC does not warrant further investigation based on the 1991 analytical data. All 1991 analytical results for PCBs were below 200 ppb, which is well below the 25 ppm (or 25,000 ppb) PCB cleanup level set for RFETS (DOE, 1995).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 400-193

IHSS Reference Number: 193, Operable Unit 16

Unit Name: Steam Condensate Leak

Approximate Location: N749,100; E2,082,250

Date(s) of Operation or Occurrence

During the week ending November 30, 1979

Description of Operation or Occurrence

An aboveground steam condensate line located between Building 443 and a valve pit north of a fuel storage tank was found to be leaking. The area between Building 443 and the valve pit was paved at the time of the leak (DOE, 1992a, 1992b).

Physical/Chemical Description of Constituents Released

The steam condensate was found to contain 0.135 ppm amines; sampling locations were not identified (DOE, 1992a, 1992b).

Response to Operation or Occurrence

The line was abandoned in place, and the condensate was rerouted through a different system by November 30, 1979 (DOE, 1992a, 1992b). This IHSS was then studied in accordance with the IAG as part of OU 16 (DOE, 1992b).

Fate of Constituents Released to the Environment

Although no direct documentation was found that detailed the fate of the amines, it is highly unlikely that any of this chemical remains in the environment from this release. As described in the *Final No Further Action Justification Documentation for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), the amine compound, used as a corrosion inhibitor in steam condensate lines, was diethylaminoethanol. This alcohol-based compound is highly soluble and readily transported in solution by water. This amine has a permissible exposure limit (PEL) of 10 mg/L, 1½ orders of magnitude greater than the concentration found in the steam condensate. The initial concentration would have been diluted even further by years of rainfall and runoff, leaving no source present. Without a source, there is no risk to human health or the environment (DOE, 1994).

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), a CADD/ROD recommending No Action under CERCLA for IHSS 193 was prepared and approved on October 28, 1994 (see declaration next page).

Comments

None.

References

DOE, 1992a, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1992b, *Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Corrective Action Decision/Record of Decision for OU16: Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Plant Operable Unit 16: Low Priority Sites
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

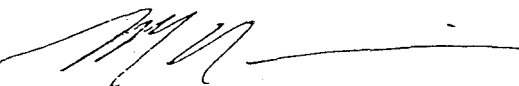
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16: Low Priority Sites, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy: No Action

OU16: Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a "No Action" remedy for five of the IHSSs (i.e., 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final "No Further Action Justification" document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

Declaration Statement

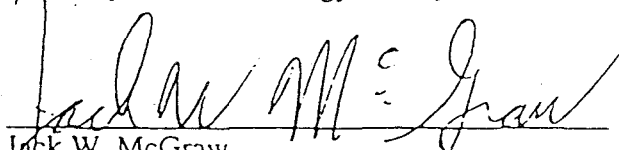
DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16: Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health-based levels, a five-year review is not required.



Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/27/94

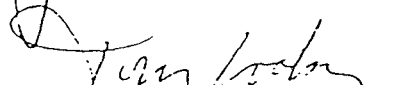
Date



Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

10/28/94

Date

PAC REFERENCE NUMBER: 400-204

IHSS Reference Number: 204, Operable Unit 15

Unit Name: Original Uranium Chip Roaster (RCRA Unit 45)

Approximate Location: N748,550; E2,082,050

Date(s) of Operation or Occurrence

1956 through 1988

Description of Operation or Occurrence

IHSS 204, the Original Uranium Chip Roaster, was used historically to oxidize uranium chips coated with small amounts of oils and coolants, converting the elemental uranium to uranium oxide. The unit is cylindrical with a diameter of 5 feet 6 inches and a height of 7 feet 4 inches. The inlet for the unit is located in Room 502 of Building 447 and the outlet is located directly downstairs in Room 32. No hazardous constituents have been treated in this unit since January 1988, when the uranium chips processed in the unit were no longer to be coated with oils and coolants.

An incident involving the roaster occurred in Room 32 of Building 447 on June 28, 1985, when an operator had filled a barrel with hot oxide and, in replacing it with a new barrel, placed the thermally hot barrel next to some cardboard. About 3 hours later, the cardboard burst into flames, setting off the sprinklers and fire alarm. The basement of the building flooded (DOE, 1991).

Physical/Chemical Description of Constituents Released

The roaster was used for the thermal treatment of hazardous waste consisting of depleted uranium chips coated with oil and coolant (freon TF and 1,1,1-trichloroethane). A fire on June 28, 1985, involved burning cardboard (DOE, 1992, 1995a).

Response to Operation or Occurrence

IHSS 204 was studied as part of OU 15, Inside Building Closures (DOE, 1995a), in accordance with the IAG. A total of 77 radiological smear samples were collected from the IHSS (Rooms 31, 32, 501, and 502; chip roaster; and wash rack/drum washing basin in Room 501). Seven hot-water rinsate samples were obtained from the IHSS.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. No radionuclides detected in the hot-water rinsate samples from IHSS 204 had activities

exceeding the permissible radionuclide levels. The pre-rinsate smear samples from the floor surfaces in Rooms 32 and 502 and the outside surfaces of the Chip Roaster inlet and outlet confirmed the presence of radiological contamination at IHSS 204. Rooms 32 and 502 are posted and managed as radiological control areas, and are subject to the procedures which are a part of the Rocky Flats Radiological Control Program in compliance with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the building. Therefore, this IHSS poses no risk to human, plant, and animal populations outside of the building.

Action/No Action Recommendation

Because IHSS 204 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was prepared, recommending clean closure under RCRA and a deferral of any action for this IHSS until final disposition of this building (DOE, 1995b). Although IHSS 204 will be closed with respect to RCRA and CERCLA, it is within a radiological control area at Rocky Flats, and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see declaration next page).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OU15: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

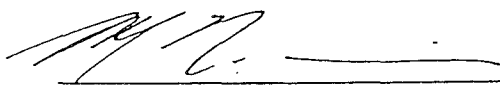
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

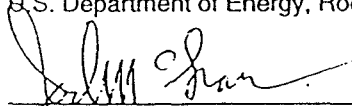
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

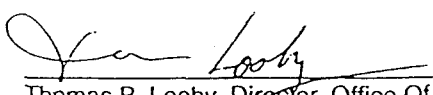
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

10/18/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

PAC REFERENCE NUMBER: 600-900

IHSS Reference Number: Not Applicable

Unit Name: Transformer Leak - 515/516

Approximate Location: N750,500; E2,083,000

Date(s) of Operation or Occurrence:

Prior to January, 1986

Description of Operation or Occurrence

Transformers 515 and 516 are located within the protected area west of Building 566 (the new laundry). Transformer 515 rests on the north side of a switchgear building and Transformer 516 is located on the south side of the same building. As presented in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), an EPA inspection in January 1986, identified one of the transformers at the 515/516 Substation to be leaking PCB-contaminated oil from a valve to the underlying soil. A leak at the 515/516 Substation was included in a June, 1986, penalty calculation for PCB violations. It is believed that the referenced leak occurred on the east side of Transformer 516. In September, 1986, Transformers 515 and 516 were again reported as leaking. A photograph dated September 1986, shows that staining is visible on the concrete pad beneath the Transformer 516 drain valve.

Physical/Chemical Description of Constituents Released

In 1985, analytical results indicated that the oil in Transformers 515 and 516 contained less than 50 ppm PCBs. In October or November of 1985, and again in June, 1986, it was reported that the coolant oil in Transformers 515 and 516 contained 63 ppm and 65 ppm PCBs, respectively. Following a January 1986, inspection, approximately nine square feet of soil beneath a valve at the 515/516 Substation was found to be contaminated with PCB-contaminated oil. In November 1986, smear samples taken on the Transformer 515 drain valve and concrete pad indicated 3.3 ppm and 2.5 ppm PCBs, respectively. Additional records indicate that samples were collected in 1992 showing PCB contamination levels in the 515 and 516 Transformer dielectric oil to be 3 ppm and less than 1 ppm, respectively.

Oil containing between 50 and 500 ppm PCBs is believed to have been released to the environment at this site however, differentiation between the two transformers is vague in historical records (DOE, 1992).

Response to Operation or Occurrence

In January 1987, it was recommended that the concrete pad beneath Transformer 516 be coated with sealant. In 1986, the fluid in Transformers 515 and 516 was drained and replaced

with a non-PCB dielectric oil. Transformers 515 and 516 were scheduled for cleanup on August 13, 1989. No further documentation could be found detailing the response to this occurrence.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The results indicated that PCB levels adjacent to the 515 and 516 transformers were less than 120 ppb and less than 26 ppm, respectively.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil screening samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080. Approximately 6 cubic yards of PCB-contaminated soil were excavated from the east side of Transformer 516 in July, 1995, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No further historical documentation could be found detailing the fate of constituents released to the environment.

Action/No Action Recommendation

Based on the 1995 final cleanup analytical results, PCB concentrations in the soil were less than 10 ppm using EPA Method 4020 and less than 934 ppb using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. PCB concentrations for the concrete samples were less than 860 ppb. Thus, the 25 ppm PCB cleanup level (DOE, 1995) has been achieved at this PAC and no further action is warranted.

Comments

In accordance with the PAM (DOE, 1995), a project completion report will be prepared and submitted in 1996 to document field activities and analytical results.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER(S): 500-901 & 905

DESS Reference Number: Not Applicable

Unit Name: Substation 555/558 Transformer Leak

Approximate Location: N749,500; E2,083,000

Date(s) of Operation or Occurrence

Prior to June 1986

Description of Operation or Occurrence

In June 1986, during routine maintenance, Transformer 555 was reported to have been leaking dielectric coolant oil. The transformer was again reported as leaking in September 1986. Transformer 555 is one of two large transformers making up the 555/558 electrical substation located near the intersection of Seventh Street and Central Avenue. Transformer 558 is located on the north side of a switchgear building connecting the two transformers. Soil contaminated with PCBs was identified in a confined area east of the 558 transformer concrete pad during a sitewide sampling program in August 1991 (DOE, 1992).

Physical/Chemical Description of Constituents Released

As presented in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), historical records indicate that Transformer 555 contained dielectric oil with 55 ppm PCBs. Smear samples collected prior to 1986, from the transformer valve and adjacent areas on the unit confirmed that small quantities (up to 6.2 ppm) of PCBs were released to the environment. No documentation was identified for sampling of the dielectric oil or surrounding area at the 558 transformer site (PAC 500-905) prior to August 1991.

Soil samples collected in August 1991, and again in April 1992, showed that PCB contamination existed primarily in one area of the substation immediately west of the 558 transformer pad. PCB levels of 480 ppm were identified at this discrete location. Samples collected from soils adjacent to Transformer 555 (PAC 500-901) showed PCB levels of 4.0 ppm.

Response to Operation or Occurrence

In 1986, the 555 transformer was retrofilled with a non-PCB dielectric oil and re-energized. No documentation was found that confirms that transformer 558 was also retrofilled; however, one reference indicates that a schedule was initiated for cleanup to take place at the substation on August 21, 1989 (DOE, 1992). No cleanup was performed at that time.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated*

Biphenyls (PAM) (DOE, 1995), follow-up sample screening was completed in July of 1995 using Midwest Research Institute (MRI) methods to verify the lateral and vertical extent of PCB migration. Approximately 5 cubic yards of PCB-contaminated soil was excavated immediately west of the 558 transformer pad. The soil was containerized and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

Analytical data indicate that PCB-contaminated soils at the 551/558 substation were located and characterized both surficially and at depth followed by an aggressive remediation schedule in July 1995. Approximately 5 cubic yards of soil were excavated and shipped offsite to an EPA licensed TSCA landfill.

Action/No Action Recommendation

PCB levels remaining in the soil following excavation were less than 10 ppm using EPA Method 4020 (Immunoassay Field Technique) and less than 1.3 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the Method 4020 Immunoassay Field Technique. Thus, the 25 ppm PCB cleanup level (DOE, 1995) has been achieved for PAC 500-905 and no further action is warranted.

Analytical data from samples collected in 1991 and 1992 using EPA Method 8080 verify that PAC 500-901 (Transformer 555) had PCB-contaminated soil below 4.0 ppm (well below the 25 ppm cleanup standard) and therefore this PAC does not warrant further investigation.

Comments

Samples collected from the concrete pads underlying the 555/558 transformers were analyzed for PCBs using EPA Method 8080; the highest result was 0.43 ppm.

The excavation site was not backfilled due to further plans to demolish the substation building once the remediation was complete. As of July 10, 1996, under an electrical upgrade construction schedule at 65 percent completion, the 555/558 substation was demolished and replaced with a more modern facility. The transformers were shipped by rail to a licensed offsite facility for incineration.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 500-902

IHSS Reference Number: Not Applicable

Unit Name: Transformer Leak - 559

Approximate Location: N750,000; E2,084,500

Date(s) of Operation or Occurrence:

Prior to 1987

Description of Operation or Occurrence

Transformer 559-1 is located on the east side of Building 559. This transformer leaked oil containing PCBs from a faulty valve prior to relocation and retrofilling in 1987 (DOE, 1992).

Physical/Chemical Description of Constituents Released

Transformer 559-1 contained 235 gallons of dielectric cooling fluid. In October and November 1985, it was reported that Transformer 559-1 contained PCB fluid exclusively (PCB > 500 ppm). In March 1989, it was reported that Transformer 559-1 contained fluid with 500,000 ppm PCBs (DOE, 1992).

Response to Operation or Occurrence

As presented in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), in October 1986, Transformer 559-1 was scheduled for cleaning at the drain valve and at the case near the drain valve. In 1987, the transformer was retrofilled and relocated to a new concrete pad several feet to the south of its previous location. Concrete material was removed from the previous transformer location. In March 1989, it was reported that Transformer 559-1 was replaced under the Environmental Hazards Elimination Project. No historical documentation was found that details further response to this occurrence.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. Based on 1991 analytical results, the highest PCB concentration found adjacent to the old concrete transformer pad was 190 ppm.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080.

In accordance with the PAM (DOE, 1995), approximately 25 cubic yards of PCB-contaminated soil was excavated in October, 1995, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the disposition of the concrete removed from the transformer pad or the fate of constituents released to the environment.

Action/No Action Recommendation

Based on the 1995 final cleanup analytical results, PCB contamination levels in the soil were less than 10 ppm using EPA Method 4020 and less than 2.4 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. PCB contamination levels on the concrete transformer pad are less than 41 ppb using EPA Method 8080. Thus, the 25 ppm PCB cleanup level (DOE, 1995) has been achieved at this PAC and no further action is warranted.

Comments

In accordance with the PAM (DOE, 1995), a project completion report will be prepared and submitted in 1996 to document field activities and analytical results.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 600-1000

IHSS Reference Number: Not Applicable

Unit Name: Transformer Storage Outside Building 662

Approximate Location: N748,900; E2,083,500

Date(s) of Operation or Occurrence:

Prior to August 1982, and through August 1986

Description of Operation or Occurrence

The first indication of transformer storage outside Building 662 is a photograph dated August 1982. There were approximately 10, pole-mounted transformers located on the east side of the building (DOE, 1992).

From June to October 1983, a large PCB transformer was stored in a catch basin outside Building 662. On October 13, 1983, the transformer was shipped offsite for disposal. Neither the condition of the transformer, nor the PCB content of the oil are known. It is also unknown whether storage in the catch basin was normal procedure, or if it was a unique occurrence.

During an inspection on January 30, 1986, the EPA audited the electrical yard outside of Building 662 and found 28, pole-mounted transformers being stored for reuse. One of the transformer was found to be leaking at that time. The PCB content of the leaking oil was then unknown, but was later determined to contain greater than 500 ppm PCBs. Documentation of the inspection indicates that ten of the 28 transformers were awaiting disposal rather than reuse, because of their age or condition (DOE, 1992).

Physical/Chemical Description of Constituents Released

Dielectric cooling oil that contained greater than 500 ppm PCBs leaked from the transformer found during the 1986 inspection. Other past activities occurring in the electrical yard from storage and repair practices are suspected to have contributed to contamination of soils adjacent to the east side of Building 662.

Response to Operation or Occurrence

Subsequent to the discovery of the leaking transformer in 1986, it was stated that if the analysis of the oil indicated that the transformer contained PCBs, it would be disposed of as PCB waste and the soil and pad would be cleaned up. No documentation was found detailing actual cleanup activities (DOE, 1992).

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1996 to verify

the lateral and vertical extent of PCB migration. Approximately 270 soil samples were collected and analyzed using EPA Method 4020. Destructive concrete samples were collected and analyzed using EPA Method 8080.

In accordance with the PAM (DOE, 1995), approximately 86 cubic yards of PCB contaminated soil were excavated, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal July, 1996.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment.

Action/No Action Recommendation

Based on the 1996 final cleanup verification analytical results, PCB contamination levels remaining in the soil were less than 10 ppm using EPA Method 4020. Results for the Method 8080 analysis will be available in August 1996. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. PCB concentrations on the concrete pads east of Building 662 were less than 1.2 ppm using EPA Method 8080. Method 8080 analytical results confirm that the 25 ppm PCB cleanup level has been achieved at this PAC and therefore, no further action is warranted.

Comments

In accordance with the PAM (DOE, 1995), a project completion report will be prepared and submitted in 1996 to document field activities and analytical results.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 600-1002

IHSS Reference Number: Not Applicable

Unit Name: Transformer Storage - West of Building 666

Approximate Location: N748,500; E2,083,000

Date(s) of Operation or Occurrence:

Unknown

Description of Operation or Occurrence

Unused and unusable transformers were stored and dismantled for spare parts on a concrete pad west of Building 666. It is suspected that transformers were also stored inside of Building 666 within secondary containment basins (DOE, 1992). Leaks and spills of transformer oil may have occurred at this site according to plant employees (DOE, 1992).

Physical/Chemical Description of Constituents Released

PCBs are the potential constituents of concern at this location; however, radionuclides (Plutonium-239) were also present in soil samples collected in July, 1991. Plutonium of unknown origin was detected at levels up to 9.057 picoCuries per gram.

Response to Operation or Occurrence

No historical documentation was found which detailed a response to spills or releases prior to 1991. Transformer storage no longer occurs at this site; however the building is still used as a primary TSCA waste storage facility. During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080.

Fate of Constituents Released to Environment

No additional historical documentation could be found which identifies the fate of constituents released to the environment.

Action/No Action Recommendation

Based on the confirmation analytical results, the highest PCB contamination level remaining in the soil adjacent to the concrete transformer pad was 1.6 ppm. This value is well below the 25 ppm PCB cleanup level established for RFETS (DOE, 1995). Radiological parameters identified (Plutonium-239, 9.057 pCi/g) are well below the proposed Tier II action levels for radionuclides in soils (DOE, 1996) and therefore no further action is warranted for this PAC.

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

DOE, 1996, *Action Levels for Radionuclides in Soils for the Rocky Flats Cleanup Agreement*, Draft, Rocky Flats Environmental Technology Site, Golden, CO, August.

PAC REFERENCE NUMBER: 600-1003

IHSS Reference Number: Not Applicable

Unit Name: Transformers North and South of 661/675 Substation

Approximate Location: N749,000; E2,083,000

Date(s) of Operation or Occurrence:

Unknown

Description of Operation or Occurrence

Evidence of a leaking valve was discovered on the north side of Transformer 661-1, which is located on the north side of the 661/675 Substation. The transformer is situated on a concrete pad, and is presently active. There is no berm around the transformer pad (DOE, 1992).

Another transformer is located on the south side of the 661/675 Substation, identified as Transformer 675-1. There is no evidence that the transformer is leaking or has leaked in the past; however, it is possible that leakage has occurred. The transformer is situated on a concrete pad, and is presently active. There is no berm around the transformer pad (DOE, 1992).

Physical/Chemical Description of Constituents Released

Based on analytical results from 1985, the PCB levels in the 661-1 and 675-1 transformer dielectric oil were 12 ppm and 5 ppm, respectively. The 1992 PCB results in the 661-1 and 675-1 transformer dielectric oil were 11 ppm and 5 ppm, respectively. Soil sampling in 1991 identified one location adjacent to the 661 transformer with 61 ppm PCBs.

Response to Operation or Occurrence

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. Analytical results for PCBs in soil adjacent to the 661 and 675 transformers were 61 ppm and 4.1 ppm, respectively.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were screened using EPA Method 4020 and concrete samples were analyzed using EPA Method 8080.

In accordance with the PAM (DOE, 1995), approximately 47 cubic yards of PCB-contaminated soil were excavated in December 1995, containerized, and shipped to an EPA

licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found which detailed the fate of constituents released to the environment.

Action/No Action Recommendation

Final cleanup confirmation analytical results indicate that PCB contamination levels remaining in the soil are less than 10 ppm using EPA Method 4020 and less than 670 ppb using EPA Method 8080. PCB contamination levels on the concrete transformer pads are less than 86 ppb using EPA Method 8080. Based on these 1996 analytical results, the 25 ppm PCB cleanup level (DOE, 1995) has been achieved and no further action is warranted at this PAC.

Comments

In accordance with the PAM (DOE, 1995), a project completion report documents field activities and analytical results at this site.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 700-185

IHSS Reference Number: 185, Operable Unit 16

Unit Name: Solvent Spill

Approximate Location: N750,000; E2,084,000

Date(s) of Operation or Occurrence

November 1986

Description of Operation or Occurrence

The fork of a forklift punctured a 55-gallon drum of 1,1,1-trichloroethane (TCA) on the southeast dock of Building 707, causing approximately 4 gallons of the solvent to leak onto the loading dock and adjacent paved areas (DOE, 1992a, 1992b).

Physical/Chemical Description of Constituents Released

The punctured drum contained TCA.

Response to Operation or Occurrence

Four bags of absorbent were used to clean up the spill. The absorbent was then cleaned up and placed in drums by the Fire Department and taken to a Hazardous Waste Storage Area (DOE, 1992a). This IHSS was then studied in accordance with the Interagency Agreement of 1991 as part of OU 16 (DOE, 1992b).

Fate of Constituents Released to the Environment

Although no documentation was found that detailed the fate of the TCA, the use of the commercial absorbent to clean up the spill minimized or potentially eliminated the source of TCA contamination. Analytical data for groundwater samples collected from a nearby monitoring well indicated that no TCA contamination is present. The high vapor pressure of TCA suggested that any residual TCA remaining on the pavement volatilized rapidly. Because the spill occurred on a paved area and the cleanup response action of the source was immediate, the wind dispersion and infiltration transport pathways were eliminated (DOE, 1994). No immediate pathway to groundwater is available at this location.

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), a CAD/ROD recommending No Action

under CERCLA for IHSS 185 was prepared and approved on October 28, 1994 (see declaration next page).

Comments

None.

References

DOE, 1992a *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1992b, *Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Corrective Action Decision/Record of Decision for OU16: Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Plant Operable Unit 16: Low Priority Sites
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

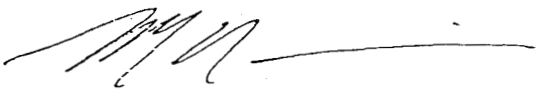
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16: Low Priority Sites, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy: No Action

OU16: Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a "No Action" remedy for five of the IHSSs (i.e., 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final "No Further Action Justification" document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

Declaration Statement

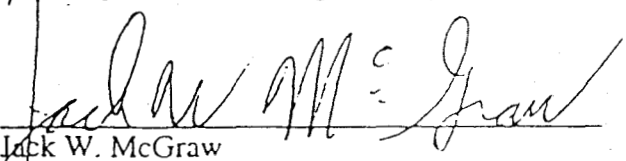
DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16: Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health-based levels, a five-year review is not required.



Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/24/94

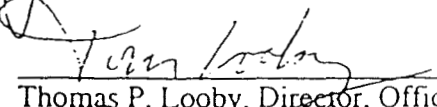
Date



Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/29/94

Date



Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

10/29/94

Date

PAC REFERENCE NUMBER: 700-194

IHSS Reference Number: 194, Operable Unit 16

Unit Name: Steam Condensate Leak - 700 Area

Approximate Location: N750,000; E2,084,000

Date(s) of Operation or Occurrence

September 26, 1979

Description of Operation or Occurrence

In September 1979, a steam condensate line break occurred in the Building 707 area. The water from the broken line flowed into the surface water drainage through Pond B-4 to Walnut Creek (DOE, 1992a, 1992b).

Physical/Chemical Description of Constituents Released

The steam condensate contained tritium at approximately 1,000 pCi/L. The volume of condensate that leaked was not determined, and it is unknown whether this area was paved at the time of the incident (DOE, 1992a, 1992b).

Response to Operation or Occurrence

On September 27, 1979, surface water drainage was diverted to Pond B-1 and the valve to Pond B-5 was closed (DOE, 1992a). This IHSS was then studied in accordance with the Interagency Agreement of 1991 as part of OU 16 (DOE, 1992b).

Fate of Constituents Released to the Environment

Between September 26 and 29, 1979, surface water sampling results from Pond B-4 ranged in activity from less than 524 pCi/L to approximately 926 pCi/L tritium. A 24-hour composite sample collected from Walnut Creek at Indiana Street on September 26, contained 1,163 pCi/L tritium. A grab sample collected the next day from the same location contained approximately 700 pCi/L tritium. As described in the *Final No Further Action Justification Documentation for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), tritium is readily transported as a component of surface water and groundwater and is highly mobile within the hydrosphere. Tritium decays rapidly and has a half-life of 12.26 years. Because the released tritium would have undergone one half-life decay cycle since the release occurred, the present-day maximum tritium activity associated with this IHSS is assumed to be less than 500 pCi/L. This value is within the range of background activities reported for tritium in surface water as reported in the *Background Geochemical Characterization Report* (EG&G 1990); the maximum tritium

background activity was reported as 980 pCi/L. Additional sampling confirmed this assumption. Surface water samples collected from Pond B-1 in 1989 yielded a tritium activity of 360 pCi/L \pm 200 pCi/L. In addition, groundwater samples collected from a nearby monitoring well contained tritium activities ranging from 110 to 383 pCi/L, within the range of background activities (390 pCi/L maximum) reported for alluvial groundwater (EG&G 1990). Because the tritium levels associated with this IHSS are within background levels and accepted state and federal standards, there is no risk to human health or the environment (DOE, 1992b).

Action/No Action Recommendation

Based on information presented in the *Final No Further Action Justification Document for Operable Unit 16, Low-Priority Sites* (DOE, 1992b), a CAD/ROD recommending No Action under CERCLA for IHSS 194 was prepared and approved on October 28, 1994 (see declaration next page).

Comments

None.

References

EG&G, 1990, *Background Geochemical Characterization Report, Rocky Flats Plant for 1989*, Golden, CO, December.

DOE, 1992a, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1992b, *Final No Further Action Justification Document for Operable Unit 16 Low-Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE, 1994, *Corrective Action Decision/Record of Decision for OU16: Low Priority Sites*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/ RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Plant Operable Unit 16: Low Priority Sites
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

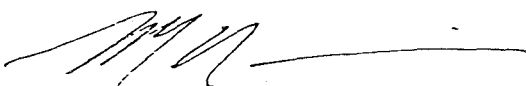
This decision document presents the selected remedial action for the Rocky Flats Plant Operable Unit (OU) 16: Low Priority Sites, located near Golden, Colorado. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). OU16 was investigated and a final No Further Action Justification Document (NFAJD) was approved in compliance with the Federal Facility Agreement and Consent Order signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedy: No Action

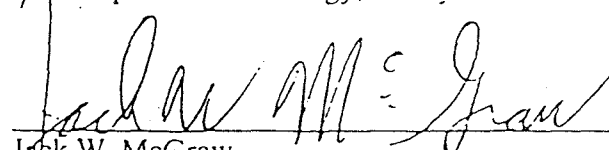
OU16: Low Priority Sites was originally composed of seven Individual Hazardous Substance Sites (IHSSs). The decision for a "No Action" remedy for five of the IHSSs (i.e., 185, 192, 193, 194, and 195) was based upon the NCP which provides for the selection of a No Action alternative when a site or OU is already in a protective state. The Risk Evaluation performed in the Final "No Further Action Justification" document determined that these IHSSs were in a protective state and presented no unacceptable risk to human health and the environment. Further investigation has been recommended for IHSS 196 as part of OU5 and for IHSS 197 as part of OU13.

Declaration Statement


DOE has determined that no remedial action is necessary to be protective of human health and the environment at *Rocky Flats Plant Operable Unit 16: Low Priority Sites*. Because the remedy will not result in hazardous substances remaining onsite above health-based levels, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/24/94
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

9/29/94
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

10/28/94
Date

PAC REFERENCE NUMBER: 700-1102

IHSS Reference Number: Not Applicable

Unit Name: Transformer Leak - 776-4

Approximate Location: N750,500; E2,083,500

Date(s) of Operation or Occurrence:

Prior to January, 1986

Description of Operation or Occurrence

Prior to January 1986, Transformer 776-4 was located approximately 100 feet west of the northwest corner of Building 776. The transformer pad at this location was positioned on an incline with drainage toward an access road 15 feet to the east. In January 1986, a plant employee reported that leaking was observed from Transformer 776-4. In February 1986, the transformer was again reported to be leaking on the radiator, around the gauges, valves, and bushing compartment. There was an oily film on most of the surfaces of the transformer and on the transformer pad. In an August 1986 photograph, staining was visible on the concrete pad beneath the transformer. Further leaking was reported in August and September of 1986. Samples collected in November 1986 of the concrete under the transformer drain valve and soil at the south edge of the transformer pad was found to be contaminated with PCBs (DOE, 1992). The transformer was moved to a new pad several feet to the north in 1987.

Physical/Chemical Description of Constituents Released

In September 1976, the fluid in Transformer 776-4 had a PCB concentration of approximately 5 percent. Samples of the oil collected in November 1977, indicate that the fluid in the transformer had a PCB concentration of approximately 3 percent. However, in October 1985, it was reported to have contained PCB oil (> 500 ppm). In November 1986, wipe samples collected from a valve, sidewall, and the concrete pad were found to contain 29.8, 5.0, and 417.5 ppm PCBs, respectively. Also in November 1986, a wipe sample collected from the concrete pad beneath the drain valve was found to contain 498 $\mu\text{g}/\text{cm}^2$ PCBs. Soil in the bottom of a small excavation at the south edge of the 776-4 transformer pad also showed 14,900 ppm PCB contamination (DOE, 1992).

Response to Operation or Occurrence

In September 1976, Transformer 776-4 was documented as being drained and refilled with a non PCB silicone oil. The transformer was scheduled for replacement under the PCB Fire Hazard Elimination Project in Fiscal Year 1988. The transformer was removed for retrofilling and relocated several feet to the north in 1987. The old transformer pad was partially removed to a depth of 4 inches and surrounded with fill. In March 1989, it was

reported that transformer 776-4 was replaced under the Environmental Hazards Elimination Project. Further cleanup of the site was scheduled on August 10, 1989 (DOE, 1992).

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration found in soil collected adjacent to the old concrete transformer pad was 480 ppm.

Working under an approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional samples were collected in 1995 and 1996 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Draft Method 4020 and concrete samples were analyzed using EPA Draft Method 8080. Based upon analytical results for the concrete samples, PCB contamination levels were less than 56 ppm. In accordance with the PAM (DOE, 1995), approximately 146 cubic yards of PCB-contaminated soil and 11 cubic yards of PCB-contaminated concrete were excavated, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the disposition of the concrete removed from the transformer pad or the fate of constituents released to the environment.

Action/No Action Recommendation

After removing approximately 146 cubic yards of PCB-contaminated soil to a depth of approximately 15 feet below the original grade, excavation was stopped. An area of approximately 20 square feet, at the bottom of the excavation, remains with PCB contamination levels that range from 46 ppm to 70 ppm using EPA Method 8080. Excavation was stopped when it was no longer feasible to continue the source removal.

Comments

In accordance with the PAM (DOE, 1995), a project completion report documents field activities and analytical results at this site. No modifications will be made to current environmental maps for this PAC (700-1102).

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER(S): 700-1103

IHSS Reference Number: Not Applicable

Unit Name: Leaking Transformers - Building 707

Approximate Location: N750,000; E2,084,000

Date(s) of Operation or Occurrence

November 1986

Description of Operation or Occurrence

Transformers 707-1 through 707-6 are located on the east side of the Building 707 roof. Concrete under several of the transformer drain valves was found to be contaminated with PCBs in November 1986 (DOE, 1992). A leak was discovered from Transformer 707-1 in 1987 during routine maintenance when the transformer was found to be low in dielectric coolant oil. Visible evidence of the leak was observed around the valve area and weld seams. Analytical data of soil and wipe samples confirmed the pad on the roof and soil on the ground immediately east of Building 707 were contaminated with PCBs. The soil contamination resulted from rainwater collecting on the rooftop where the transformers exist (DOE, 1992), then being released through a downspout to the ground.

Physical/Chemical Description of Constituents Released

Wipe samples collected from the concrete under several of the transformer drain valves were analyzed in November 1986. PCB concentrations were between 135 and 7,200 ppm. PCB contamination of the soil immediately under a downspout was detected at 1,600 ppm (DOE, 1992).

Response to Operation or Occurrence

In March 1991, surface soil samples were collected immediately east of Building 707 under a downspout suspected of being a migration pathway from the contaminated rooftop directly above. The analytical data from these soil samples indicated that, as suspected, contamination (1,600 ppm) was most evident under the downspout and decreased in concentration with distance outward from the building to approximately 9.7 ppm. Subsurface soil samples collected at depths between 1.0 and 1.5 feet in the same locations measured 180 ppm and <1.0 ppm, respectively.

In 1992, an extensive TSCA cleanup of PCB contamination on the 707 rooftop was performed that included the removal of the leaking 707-1 transformer, considerable wipe sampling of the concrete rooftop to achieve a cleanup standard of 100 mg/100 cm (as required by EPA), and subsequent replacement of the repaired transformer. The 707-1 transformer was retrofilled

with a non-PCB dielectric oil and re-energized. Remediation of the soil was scheduled for cleanup under the IAG.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), further sample screening was completed in July and August of 1995 using Midwest Research Institute (MRI) methods (EPA 1986) to verify the lateral and vertical extent of PCB migration. Approximately 67 cubic yards of PCB-contaminated soil was excavated from the site. The soil was containerized, and shipped to an EPA licensed TSCA landfill in Kettleman California for disposal in September 1995.

Fate of Constituents Released to Environment

The extensive soil sampling that took place in March 1991 and August 1995 prove that PCB-contaminated rainwater from the Building 707 rooftop did not migrate to an existing storm drain over 100 ft. down gradient.

Action/No Action Recommendation

PCB levels remaining in the soil were less than 10 ppm using EPA Method 4020 (Immunoassay Field Technique) and less than 12 ppm (5 ppm Aroclor 1260, 7 ppm Aroclor 1254) using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the Method 4020 Immunoassay Field Technique. Based on these analytical results (September 1995), the 25 ppm PCB cleanup level (DOE, 1995) has been achieved for PAC 700-1103 and therefore no further action is warranted. Analytical data confirming the remediation of this PAC are documented in the project completion report.

Comments

The excavation site was backfilled and re-graded upon receipt of Method 8080 cleanup confirmation samples in August 1995.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 700-1104

IHSS Reference Number: Not Applicable

Unit Name: Leaking Transformer - Building 708

Approximate Location: N750,000; E2,084,000

Date(s) of Operation or Occurrence:

November 1986 through 1987

Description of Operation or Occurrence

Transformer 708-1 is located on the west side of Building 708. In February 1987, concrete under the 708-1 transformer drain valve was found to be contaminated with PCBs. According to an interview with EG&G Utilities personnel, electrical equipment located west of Building 708 leaked PCB-contaminated oil prior to 1987 (DOE, 1992).

Physical/Chemical Description of Constituents Released

Wipe samples collected from the concrete under the 708-1 transformer drain valve were analyzed and found to contain 1,035 g and 3,750 g of PCBs (DOE, 1992). Soil samples collected in August 1991 showed PCB contamination around the 708-1 concrete pad to be 860 ppm.

Response to Operation or Occurrence

Four transformers were removed and retrofilled from this site in 1987. Rock and gravel fill were placed around the transformer pads prior to replacement of non PCB transformers in 1987 or 1988. No historical documentation was found that further details response to this occurrence (DOE, 1992).

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration found in soil samples collected adjacent to the concrete transformer pads was 860 ppm.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA Method 4020. In accordance with the PAM (DOE, 1995), approximately 21 cubic yards of PCB-contaminated soil was excavated, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found which detailed the fate of constituents released to the environment.

Action/No Action Recommendation

The 1995 final cleanup verification analytical results for PCBs in the soil were less than 10 ppm using EPA Method 4020 and less than 3.2 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. These results are well below the 25 ppm PCB cleanup level (DOE, 1995); therefore, this PAC does not warrant further investigation. There were no detections of PCBs on the concrete transformer pad using EPA Method 8080.

Comments

In accordance with the PAM (DOE, 1995), a project completion report documents field activities and analytical results for this site.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 700-1111

IHSS Reference Number: Not Applicable

Unit Name: Leaking Transformer - Building 750

Approximate Location: N750,000; E2,084,500

Date(s) of Operation or Occurrence:

Prior to 1987

Description of Operation or Occurrence

Transformer 750-1 is located on the northeast side of Building 750, approximately 80 feet from a cafeteria entrance. As presented in the *Historical Release Report for the Rocky Flats Plant* (DOE, 1992), in August 1985, Transformer 750-1 was reported as a potential PCB "exposure risk to food or feed." The exposure risk was related to a small crack in the berm surrounding the transformer and the proximity of the transformer to the cafeteria entrance. According to interviews with Utilities personnel, prior to 1987 this transformer leaked dielectric fluid containing PCBs.

Physical/Chemical Description of Constituents Released

It was reported that Transformer 750-1 contained 465 gallons of PCB fluid weighing 2,533 kilograms. In October 1985, it was reported that Transformer 750-1 contained PCB fluid exclusively. Soil samples collected in August 1991, show that PCB contamination of 160 ppm was released from the transformer (DOE, 1992).

Response to Operation or Occurrence

In August 1985, it was recommended that the concrete berm surrounding the transformer be sealed. In January 1986, it was anticipated that Transformer 750-1 would be removed and replaced under the Fiscal Year 1986 Environmental Hazards Elimination Project. In 1987, the transformer was retrofilled and relocated to a new concrete pad several feet to the east of its previous location (DOE, 1992).

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB concentration detected in soil samples collected adjacent to the old concrete transformer pad was 160 ppm.

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), additional sample screening was completed in 1995 to verify the lateral and vertical extent of PCB migration. Soil samples were analyzed using EPA

Method 4020 and concrete samples were analyzed using EPA Method 8080.

In accordance with the PAM (DOE, 1995), approximately 26 cubic yards of PCB-contaminated soil were excavated, containerized, and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment.

Action/No Action Recommendation

The 1995 final cleanup verification analytical results for PCBs in the soil were less than 10 ppm using EPA Method 4020 and less than 5.9 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the EPA Method 4020 (Immunoassay Field Technique) analytical results. There were no detections of PCBs on the concrete transformer pad using EPA Method 8080. The 25 ppm PCB cleanup level (DOE, 1995) has been achieved at this PAC; therefore, no further action is warranted.

Comments

In accordance with the PAM, a project completion report documents field activities and analytical results for this site.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 700-1112

MISS Reference Number: Not Applicable

Unit Name: Leaking Transformer - Building 776-5

Approximate Location: N750,000; E2,084,500

Date(s) of Operation or Occurrence:

June 1986 to August 1989

Description of Operation or Occurrence

Transformer 776-5 is located on the west side of Building 714 within the Protected Area. The 1500 KVA transformer was manufactured in 1969 and was reported as leaking coolant oil in June, 1986 (DOE, 1992).

Physical/Chemical Description of Constituents Released

The 308 gallons of dielectric fluid in Transformer 776-5 contained 807 ppm PCBs at one point prior to 1989 (DOE, 1992). Soil sampling in August 1991, show PCB contamination to be 88 ppb.

Response to Operation or Occurrence

Transformer 776-5 was scheduled for cleanup on August 12, 1989. No documentation could be found to verify what cleanup was performed at this site if any.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB detection in soil samples collected adjacent to the concrete transformer pad was 88 ppb.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment if any.

Action/No Action Recommendation

This PAC does not warrant further investigation based on the 1991 PCB result of less than 88 ppb; this value is well below the 25 ppm (or 25,000 ppb) PCB cleanup level for RFETS (DOE, 1995).

Comments

Transformer 776-5 is also referred to as transformer 714-1 and 771-3 in older documents due to its proximity to Buildings 714 and 771. However, Transformer 714-1 is located 70 feet to the south of Building 771 on a concrete pad (DOE, 1992).

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 800-178

IHSS Reference Number: 178, Operable Unit 15

Unit Name: Building 881 Drum Storage Area

Approximate Location: N748,000; E2,083,000

Date(s) of Operation or Occurrence

1953 - Present

Description of Operation or Occurrence

The Building 881 Drum Storage Area was first used in 1953 when Building 881 operations began and was used as a RCRA 90-day accumulation area. The storage area is located in Room 165 and measures 5 feet by 5 feet. A maximum number of five 55-gallon drums were stored at this location. The drums were stored directly on the floor with no berms around the drums (DOE, 1992, 1995a).

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained wastes solvents (volatile organic compounds) and possibly low-level radioactive waste. There have been no documented releases or visual evidence of a release (DOE, 1992, 1995a).

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 178 was studied as part of OU 15, Inside Building Closures (DOE, 1995a), in accordance with the IAG. Thirty radiological smear samples were collected from the IHSS and three hot-water rinse samples were obtained from the IHSS, perimeter, and pathway areas. Final radiological surveys at each of the 30 initial smear sample locations were performed.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides and beryllium exceeded the screening criteria. IHSS 178 met the federal occupational radiation protection standards and poses no unacceptable risk to workers.

Action/No Action Recommendation

Because IHSS 178 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was prepared recommending clean closure under RCRA and No Action under CERCLA for IHSS 178 (DOE, 1995b). The CAD/ROD received final approval on October 18, 1995 (see declaration next page).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OU15: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

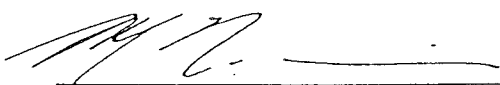
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

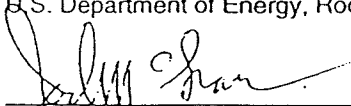
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

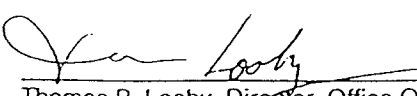
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

10/18/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

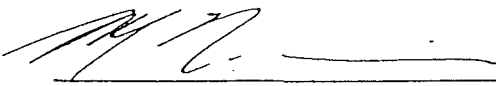
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

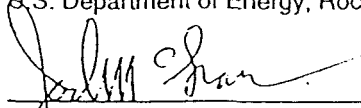
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

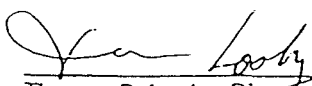
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

10/18/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

PAC REFERENCE NUMBER: 800-179

IHSS Reference Number: 179, Operable Unit 15

Unit Name: Building 865 Drum Storage Area

Approximate Location: N749,000; E2,084,000

Date(s) of Operation or Occurrence

1970 through 1995

Description of Operation or Occurrence

The Building 865 Drum Storage Area was first used in 1970 as a RCRA 90-day accumulation area. The storage area was located in Room 145 and measured 12 feet by 8 feet. A maximum number of ten 55-gallon drums were stored at this location. They were stored directly on the floor with no berms around the drums and no floor drains (DOE, 1992, 1995a).

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained oils, chlorinated solvents, low-level radioactive waste, and possibly beryllium. There has been no documented or visual evidence of a release at this location (DOE, 1992, 1995a).

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 179 was studied as part of OU 15, Inside Building Closures (DOE, 1995a), in accordance with the IAG. Twenty-three radiological and beryllium smear samples were collected from the IHSS and three hot-water rinsate samples were obtained from the IHSS, perimeter, and pathway areas. Final radiological surveys were performed at each of the 23 initial smear sample locations.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides and beryllium exceeded the screening criteria. IHSS 179 met the federal occupational radiation protection standards and poses no unacceptable risk to workers. In addition, IHSS 179 is located within radiological control areas, and is subject to the procedures that are a part of the Rocky Flats Radiological Control Program in compliance with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the buildings. Therefore, this IHSS poses no risk to human,

plant, or animal populations outside of the building.

Action/No Action Recommendation

Because IHSS 179 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was prepared, recommending clean closure under RCRA and a deferral of any action for this physical location until final disposition of the building (DOE, 1995b). Although IHSS 179 will be closed with respect to CERCLA, it is within a radiological control area at Rocky Flats, and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see declaration next page).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OU15: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

PAC REFERENCE NUMBER: 800-180

IHSS Reference Number: 180, Operable Unit 15

Unit Name: Building 883 Drum Storage Area

Approximate Location: N748,500; E2,084,000

Date(s) of Operation or Occurrence

1981 - 1995

Description of Operation or Occurrence

The Building 883 Drum Storage Area was first used in 1981 as a RCRA 90-day accumulation area. The storage area was located in Room 104, which measures 16 feet by 10 feet. A maximum of thirty 55-gallon drums were stored at this location. They were stored directly on the floor with no berms around the drums and no floor drains (DOE, 1992, 1995a).

Physical/Chemical Description of Constituents Released

The drums stored in the IHSS contained oils contaminated with solvents, uranium, and beryllium. There have been no documented releases or visual evidence of a release (DOE, 1992, 1995a).

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 180 was studied as part of OU 15, Inside Building Closures (DOE, 1995a) in accordance with the IAG. Forty-nine radiological and beryllium smear samples were collected from the IHSS and four hot water rinsate samples were obtained from the IHSS, perimeter, and pathway areas. Final radiological surveys at each of the 49 initial smear sample locations were performed.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. The data collected during the CERCLA evaluation did not yield detections of radionuclides above the permissible levels in the hot water rinsate samples; and none of the post-rinsate smear samples exhibited total alpha or beta activity exceeding the permissible levels. However, seven of the sampling areas surveyed for beta dose-rate exceeded the established screening criteria limit of 2.5 mrem/hr. An evaluation based on occupational exposure showed total effective dose equivalents below 5 rem/yr. In addition, IHSS 180 is located within a radiological control area, and subject to the procedures which are a part of the Rocky

Flats Radiological Control Program in compliance with the protective standards for radionuclides. The Rocky Flats Radiological Control Program will assure that no contaminants are released from the buildings. Therefore, this IHSS poses no risk to human, plant, or animal populations outside of the building.

Action/No Action Recommendation

Because IHSS 180 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was prepared, recommending clean closure under RCRA and a deferral of any action for this physical location until final disposition of the building (DOE, 1995b). Although IHSS 180 will be closed with respect to RCRA and CERCLA, it is within a radiological control area at Rocky Flats and action at this physical area is deferred until final disposition of the building in which it is located. Any future CERCLA action decisions will be made based upon the ultimate disposition of the building. The CAD/ROD received final approval on October 18, 1995 (see declaration next page).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OUI5: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

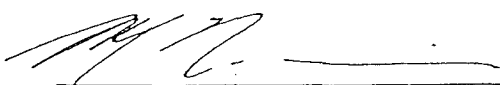
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

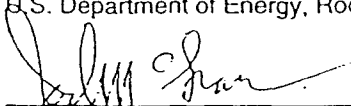
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

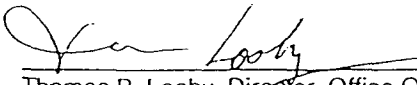
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

10/18/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

PAC REFERENCE NUMBER: 800-211

IHSS Reference Number: 211, Operable Unit 15

Unit Name: Building 881 Drum Storage Area, Unit 26

Approximate Location: N748,000; E2,084,000

Date(s) of Operation or Occurrence

1981 - Present

Description of Operation or Occurrence

The Building 881 Drum Storage Area was first used in 1981 and is currently used as a RCRA 90-day accumulation area. The storage area is located in Room 266B and measures 20 feet by 10 feet. The maximum number of 55-gallon drums stored there is 29 (DOE, 1992, 1995a).

Physical/Chemical Description of Constituents Released

The wastes stored in the IHSS have historically included low-level radioactive combustibles (e.g., rags and wipes), metals, glass, and materials that contained solvents and/or metals generated by laboratories in the building. There have been no documented releases or visual evidence of a release (DOE, 1992, 1995a).

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 211 was studied as part of OU 15, Inside Building Closures (DOE, 1995a) in accordance with the IAG. Thirty-two radiological smear samples were collected from the IHSS and three hot-water rinsate samples were obtained from the IHSS, perimeter, and pathway areas. Final radiological surveys were performed at each of the 32 initial smear sample locations.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides exceeded the screening criteria. IHSS 211 met the federal occupational radiation protection standards and poses no unacceptable risk to workers.

Action/No Action Recommendation

Because IHSS 211 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was

prepared recommending clean closure under RCRA and No Action under CERCLA for this physical area (DOE, 1995b). The CAD/ROD received final approval on October 18, 1995 (see declaration next page)

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase 1 RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OU15: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

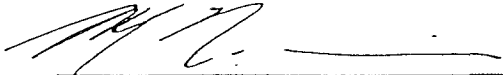
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

Description of the Selected Remedies

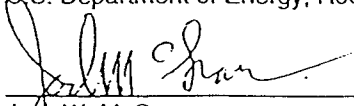
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

Declaration Statement

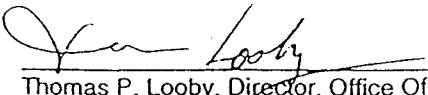
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.


Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office

9/21/95
Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency

10/18/95
Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment

9/29/95
Date

PAC REFERENCE NUMBER: 800-217

IHSS Reference Number: 217 Operable Unit 15

Unit Name: Building 881 Cyanide Bench Scale Treatment, Unit 32

Approximate Location: N748,000; E2,084,000

Date(s) of Operation or Occurrence

1986 through September 1988

Description of Operation or Occurrence

IHSS 217 was a hazardous waste treatment unit located in Room 131C in Building 881. IHSS 217 consisted of a 4-foot by 5-foot painted metal fume hood and laboratory table, three 4-liter polyethylene bottles, a glass beaker, and a chlorine-specific ion electrode. The bench scale treatment that occurred at this location involved the analysis of the laboratory wastes for cyanide content by using a cyanide still. Wastes from the analysis were collected in 4-liter polyethylene bottles that usually took about 2 months to fill. The contents of the bottles were reacted with sodium or calcium hypochlorite to oxidize the cyanide to cyanate. Once neutralization was complete, the contents of the bottle were poured down the process waste drain for transport to Building 374 for further treatment (DOE, 1992, 1995a).

Physical/Chemical Description of Constituents Released

The wastes involved laboratory waste containing cyanide. There have been no documented releases or visual evidence of a release (DOE, 1992, 1995a).

Response to Operation or Occurrence

Although no documentation was found to indicate a release to the environment, IHSS 217 was studied as part of OU 15, Inside Building Closures (DOE, 1995a) in accordance with the IAG. Thirteen radiological smear samples were collected from the IHSS and one hot-water rinsate sample was obtained from the IHSS. Final radiological surveys were performed at each of the 13 initial smear sample locations.

Fate of Constituents Released to the Environment

No RCRA-regulated constituents of regulatory concern were identified in the IHSS verification sampling. Also, none of the data collected during the CERCLA evaluation with respect to radionuclides exceeded the screening criteria. IHSS 217 meets the federal occupational radiation protection standards and poses no unacceptable risk to workers.

Action/No Action Recommendation

Because IHSS 217 meets the clean closure requirements of the Rocky Flats RCRA Permit and the federal occupational radiation protection standards (DOE, 1995a), a CAD/ROD was prepared recommending clean closure under RCRA and No Action under CERCLA for this IHSS (DOE, 1995b). The CAD/ROD received final approval on October 18, 1995 (see declaration next page).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO.

DOE, 1995a, *Phase I RFI/RI Report for Operable Unit 15, Inside Building Closures*, RFP/ERM-94-00035, Rocky Flats Environmental Technology Site, Golden, CO, January.

DOE, 1995b, *Corrective Action Decision/Record of Decision for OU15: Inside Building Closures*, Rocky Flats Environmental Technology Site, Golden, CO, August.

CORRECTIVE ACTION DECISION/
RECORD OF DECISION DECLARATION

Site Name and Location

Rocky Flats Environmental Technology Site (Rocky Flats) Operable Unit 15: Inside Building Closures
Golden, Jefferson County, Colorado

Statement of Basis and Purpose

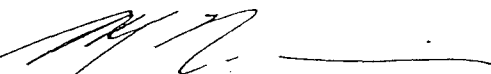
This decision document presents the selected remedial action/corrective action for the Rocky Flats Operable Unit (OU) 15: Inside Building Closures. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the Colorado Hazardous Waste Act (CHWA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Resource Conservation Recovery Act (RCRA) is administered through the CHWA by the Colorado Department of Public Health and the Environment (CDPHE). OU15 was investigated and a Preferred Alternative was selected in compliance with the Federal Facility Agreement and Consent Order Inter-Agency Agreement (IAG) signed by the U.S. Department of Energy (DOE), the State of Colorado, and the U.S. Environmental Protection Agency (EPA) on January 22, 1991.

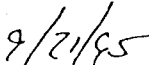
Description of the Selected Remedies

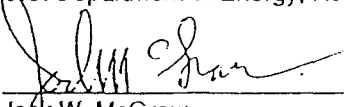
OU15: Inside Building Closures is composed of six Individual Hazardous Substance Sites (IHSSs). The preferred alternative for OU15 consists of the following actions: 1) Clean Closure under RCRA for all six of the OU15 IHSSs; 2) a No Action CERCLA decision for IHSSs 178, 211, and 217; and 3) a deferral of any CERCLA actions at IHSSs 179, 180, and 204 until final disposition of their respective buildings. RCRA closure certification for the six IHSSs, signed by an independent registered professional engineer, has been approved by CDPHE. The No Action CERCLA decision for IHSSs 178, 211, and 217 is based upon the NCP, which provides for the selection of a No Action alternative when a site or OU is already in a protective state. OU15 IHSSs 179, 180, and 204 will be closed as IAG IHSSs and any future CERCLA action decisions will be made based upon the ultimate disposition of the buildings, inclusive of the physical areas previously described as OU15 IHSSs. Evaluation of remedial alternatives and closure activities included waste minimization considerations.

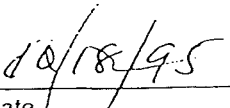
Declaration Statement

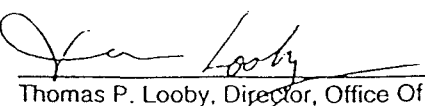
DOE has determined that no remedial action is necessary to be protective of human health and the environment at IHSSs 178, 211, and 217 because they meet the clean closure requirements of the Rocky Flats RCRA Permit (RFRP) and the Federal occupational radiation protection standards. At IHSSs 179, 180, and 204, no remedial action is currently necessary, because they meet the clean closure requirements of the RFRP and the Rocky Flats radiological control program is in compliance with Applicable or Relevant and Appropriate Requirements (ARARs)/To Be Considered (TBC) criteria and other identified protective standards. Future CERCLA actions may be required at the time of ultimate disposition of the buildings. Because the remedy will not result in hazardous substances remaining onsite above ARARs, TBCs, or protective standards, a five-year review is not required.

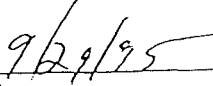

Mark N. Silverman, Manager
U.S. Department of Energy, Rocky Flats Field Office


Date


Jack W. McGraw
Deputy Regional Administrator, Region VIII
U.S. Environmental Protection Agency


Date


Thomas P. Looby, Director, Office Of Environment,
Colorado Department of Public Health and Environment


Date

PAC REFERENCE NUMBER: 800-1207

IHSS Reference Number: Not Applicable

Unit Name: Transformer 883-4

Approximate Location: N749,000; E2,084,000

Date(s) of Operation or Occurrence

1985 through 1987 or 1988

Description of Operation or Occurrence

Transformer 883-4 is located at the southeast corner of Building 883. Utilities reported that it may have leaked prior to being drained and refilled with non PCB dielectric oil in either 1986 or 1987. The original pad was partially removed and the top scarified to make room for a new pad that was constructed several feet to the west. After retro-filling, the transformer was relocated to the new pad. Documentation could not be found that details when these activities took place. The transformer was found to be leaking during an inspection on November 7, 1985. Leakage was also found on January 30, 1986, during an EPA inspection for compliance with TSCA. This transformer was on the list for cleanup and/or repair on February 11, 1986, because of leakage around the top and bottom valves and oil on the surface of the concrete pad and transformer wall (DOE, 1992).

Physical/Chemical Description of Constituents Released

Historical records indicate that Transformer 883-4 contained dielectric oil with greater than 500 ppm PCBs prior to 1986 (DOE, 1992); however, another document indicates that the transformer oil was sampled in 1992 and found to contain 6 ppm PCBs. No documentation could be found as to whether smear samples were ever collected at this location (DOE, 1992).

Response to Operation or Occurrence

Although this site was not directly audited by an EPA representative in 1986, it was required that the transformer be removed or replaced by Fiscal Year 1987 or 1988 (DOE, 1992). The 883-4 transformer was retrofilled with a non-PCB dielectric oil and re-energized on a new foundation several feet to the west prior to or during Fiscal Year 1988. No documentation was found confirming that a cleanup schedule for the surrounding soil was initiated at that time.

Soil samples collected during a sitewide sampling program in August 1991, showed that PCB contamination existed in the soils surrounding the old transformer pad. PCB concentrations were identified at 160 ppm in one location and 12 ppm in another location (adjacent to the transformer pad).

Under the approved *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls* (PAM) (DOE, 1995), further sampling was completed in July and August of 1995 using Midwest Research Institute (MRI) methods (EPA 1986) to verify the lateral and vertical extent of PCB migration. Approximately 28 cubic yards of PCB-contaminated soil were excavated from the old transformer site. The soil was containerized and shipped to an EPA licensed TSCA landfill in Kettleman, California for disposal.

Fate of Constituents Released to Environment

Analytical data show that PCB-contaminated soils at the old 883-4 transformer site were located and characterized both surficially and at depth. Characterization was followed by remediation in late July and early August of 1995.

Action/No Action Recommendation

PCB levels remaining in the soil following the 1995 excavation were less than 10 ppm using EPA Method 4020 (Immunoassay Field Technique) and less than 3.1 ppm using EPA Method 8080. Split samples were analyzed using EPA Method 8080 to provide confirmation of the Method 4020 Immunoassay Field Technique. Destructive concrete samples were collected from the old pad using an impact drill and analyzed using EPA Method 8080. Analytical results from the concrete sampling were below 2.5 ppm PCBs and the old pad was disposed of in the onsite landfill. Based upon analytical results (July - August 1995), the 25 ppm PCB cleanup level (DOE, 1995) has been achieved for PAC 800-1207 and therefore this PAC does not warrant further investigation. Analytical data confirming the successful remediation of this PAC is documented in the project completion report as specified in the approved PAM.

Comments

The excavation site was backfilled and resurfaced with asphalt upon receipt of Method 8080 cleanup confirmation samples in August 1995.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

EPA, 1986, *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup*, Office of Toxic Substances, EPA-560/5-86-017, Washington, D.C., May.

PAC REFERENCE NUMBER: 800-1208

IHSS Reference Number: Not Applicable

Unit Name: Transformer 881-4

Approximate Location: N749,000; E2,084,000

Date(s) of Operation or Occurrence:

Unknown - 1987

Description of Operation or Occurrence

Transformer 881-4 is located on the north side of Building 881. Utilities personnel reported that the transformer may have leaked prior to being retrofilled in September of 1986. Visual inspection of the transformer on February 11, 1986, revealed a leak on the top and bottom valves, tap changer, and pad. Another document indicates that residual stains existed on the concrete pad in January 1987 (DOE, 1992).

Presently, the transformer is located in a gravel filled berm with no indication of leakage. The previously mentioned concrete may exist beneath the gravel. There are no drains in the vicinity.

Physical/Chemical Description of Constituents Released

Transformer 881-4 contained 435 gallons of dielectric coolant oil while in service. Historical records indicate that the oil contained 110 ppm PCBs prior to being retrofilled.

Response to Operation or Occurrence

The transformer oil was drained and replaced with non-PCB dielectric oil in September of 1986.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. Based on 1991 analytical results, PCB contamination levels are less than 4.5 ppm in the soil.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment.

Action/No Action Recommendation

This PAC does not warrant further investigation based on 1991 analytical data indicating that PCB contamination levels are less than 4.5 ppm, which is well below the 25 ppm cleanup level established for RFETS (DOE, 1995).

Comments

Transformer 881-4 is currently out of service.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 800-1209

IHSS Reference Number: Not Applicable

Unit Name: Leaking Transformers, 800 Area

Approximate Location: N749,000; E2,084,000

Date(s) of Operation or Occurrence:

Unknown - 1991

Description of Operation or Occurrence

Three active transformers (883-1, 883-2, 883-3) and a switchgear apparatus are located on the north side of Building 883. Utilities personnel reported that all components within this complex may have leaked prior to being retrofilled in 1987. Oil stains were visible at the valve on one of the transformers (DOE, 1992). The area is bermed, with rock and gravel placed inside and outside of the berm. There are no drains at this site.

Physical/Chemical Description of Constituents Released

Utilities personnel suspected that PCBs may have leaked at this site (DOE, 1992).

The 1985 analytical results for PCBs in the oil for transformers 883-1, 883-2, and 883-3 were 84 ppm, 42 ppm, and 17 ppm, respectively. Based on 1992 analytical results, the PCB contamination levels in the oil for transformers 883-1, 883-2, and 883-3 were 3 ppm, 35 ppm, and 16 ppm, respectively after being retrofilled in 1987.

Response to Operation or Occurrence

The transformers were retrofilled with non-PCB dielectric coolant oil in 1987 as part of a plant-wide compliance schedule driven by TSCA.

During a sitewide sampling program in August 1991, soil samples were collected in the vicinity of these transformers in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. Based on 1991 analytical results, PCB contamination levels in the soil were below 6.8 ppm.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment.

Action/No Action Recommendation

This PAC does not warrant further investigation based on 1991 analytical data. Method 8080 PCB analytical levels are less than 6.8 ppm in the soil, which is well below the 25 ppm cleanup level established for RFETS (DOE, 1995).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 800-1210

IHSS Reference Number: Not Applicable

Unit Name: Transformers 865-1 and 865-2

Approximate Location: N749,000; E2,084,000

Date(s) of Operation or Occurrence:

Unknown - 1987

Description of Operation or Occurrence

Transformers 865-1 and 865-2 are located on the northwest side of Building 865. Utilities personnel indicated that these transformers may have leaked in the past. In 1987, the transformers were retrofilled and relocated several feet to the north and placed on a new concrete pad with berms. The old concrete pad was partially removed to make room for the new pad. It is unknown whether the old pad had a secondary containment berm.

Physical/Chemical Description of Constituents Released

The fact that these transformers were retrofilled indicates that PCBs may have been involved. No additional historical data could be found on PCB concentrations of dielectric coolant oils at this site.

Response to Operation or Occurrence

The transformers were removed from the old pad, retrofilled, and placed on a new concrete pad.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The 1991 PCB results were below 1.3 ppm in the soil.

Fate of Constituents Released to Environment

No historical documentation was found which detailed the fate of constituents released to the environment.

Action/No Action Recommendation

This PAC does not warrant further investigation based on 1991 analytical data indicating that PCB contamination levels are less than 1.3 ppm, which is well below the 25 ppm cleanup level established for RFETS (DOE, 1995).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

PAC REFERENCE NUMBER: 900-1306

IHSS Reference Number: Not Applicable

Unit Name: Transformers 991-1 and 991-2

Approximate Location: N748,000; E2,085,500

Date(s) of Operation or Occurrence:

Prior to February, 1986

Description of Operation or Occurrence

In February 1986, several leaks were observed on pipe flanges, valves, gauges, and bushing compartments of Transformers 991-1 and 991-2. Large amounts of oil were noted on the ground under the two transformers (DOE, 1992).

Physical/Chemical Description of Constituents Released

The oil in Transformers 991-1 and 991-2 contained PCBs at concentrations of 114 ppm and 60 ppm, respectively (DOE, 1992).

Response to Operation or Occurrence

The PCBs were cleaned up and the transformers repaired in February 1986, according to one reference document in the HRR (DOE, 1992). It is not clear whether the clean-up involved soil.

During a sitewide sampling program in August 1991, soil samples were collected in accordance with approved EPA sampling protocol and analyzed for PCBs using EPA Method 8080. The highest PCB detection in soil samples collected adjacent to the concrete transformer pads was 510 ppb.

Fate of Constituents Released to Environment

No historical documentation was found that detailed the fate of constituents released to the environment.

Action/No Action Recommendation

This PAC does not warrant further investigation based on 1991 analytical data indicating that PCB contamination levels are less than 510 ppb, which is well below the 25 ppm cleanup standard established for RFETS (DOE, 1995).

Comments

None.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Final Proposed Action Memorandum for Remediation of Polychlorinated Biphenyls*, RF/ER-95-0066.UN, Rocky Flats Environmental Technology Site, Golden, CO, July.

SECTION 4.0

ENVIRONMENTAL PROJECT STATUS (TO DATE)

PAC REFERENCE NUMBER: NE-110

IHSS Reference Number: 110, Operable Unit 2

Unit Name: Trench T-3

Approximate Location: N750,000; E2,087,000

Date(s) of Operation or Occurrence

1964 - 1965

Description of Operation or Occurrence

Trench T-3 was used primarily for the disposal of sanitary waste-water and sewage treatment plant sludge. The sludge removed from the waste-water treatment plant was placed on sludge drying beds. Dried material removed from the sludge drying beds was placed in the disposal trenches (also referred to as the East Trenches) until August 1968. The sanitary sludge disposal trenches are reported to be approximately 10 feet deep with two feet of soil cover (DOE, 1992). In addition, miscellaneous waste was also disposed in Trench T-3 including crushed drums, asphalt planking, and construction debris.

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is present in this sludge (DOE, 1992). It is reported that the older sludge had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge in the East Trenches was reported between a minimum of 382 pCi/g in August 1964, and a maximum of 3,591 pCi/g in June 1960. Uranium contamination may also be present in flattened drums that were disposed in this trench. Flattened drums, estimated to be more than 300 in total number are known to exist in Trench T-3 (DOE, 1996b).

Approximately 2,400 gallons of water and lathe coolant generated in Building 444 was also disposed of in one of the East Trenches or in Trench T-2. This waste had an average activity of 150,000 dpm/l (believed to be total alpha activity). The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kg of depleted uranium present in the waste. It is unknown whether or not this material was in drums (DOE, 1992).

Responses to Operation or Occurrence

A source removal action was performed in the summer of 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was authorized by a Proposed Action Memorandum (PAM) for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111.1, Revision 2, dated March 28, 1996 (DOE, 1996a). Approximately 1,706 cubic yards of volatile organic compound contaminated material was removed from T-3

and treated. Approximately 200 cubic yards of debris, primarily crushed drums, was also removed from the trench. A completion report for the project has been prepared and will be submitted to DOE in September 1996. The completion report details the treatment process, contaminants removed, the condition of the trench following the removal action, and analytical results.

Fate of Constituents Released to Environment

The soils treated as part of the source removal action were returned to the trench. Debris excavated from the trench were containerized pending characterization and are planned to be shipped to an off-site disposal facility in 1997 (DOE, 1996b). The source removal action for Trench T-3 removed contamination sources above the cleanup values stipulated in the PAM. A contamination plume is known to exist below the trench at concentrations which are beneath the cleanup values specified in the approved PAM. It is believed that no further groundwater contamination will be generated from Trench T-3 as a result of this source removal.

Comments

Trenches T-4 through T-11 along with this trench are also called the East Trenches.

Trench T-3 (PAC NE-110) has few operational differences from Trench T-2 (PAC 900-109) and Trenches T-4 through T-11 (PAC NE-111). All of these trenches were used primarily for the disposal of sanitary waste-water treatment plant sludge.

No documentation was found regarding the exact dates of operation of individual trenches. Interviewees were unaware of operating dates and could provide no additional information.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1996a, *Proposed Action Memorandum for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111.1, Revision 2*, RF/ER-95-111.UN, March.

DOE, 1996b, *Draft Completion Report for the Source Removal at Trenches T-3 and T-4 IHSS 110 and 111.1*, RF/ER-96-0000, September.

PAC REFERENCE NUMBER: NE-111.1

IHSS Reference Number: 111.1, Operable Unit 2

Unit Name: Trench T-4.

Approximate Location: N750,000; E2,087,500

Date(s) of Operation or Occurrence

1965 - 1967

Description of Operation or Occurrence

Trench T-4 was used primarily for the disposal of sanitary waste-water and sewage treatment plant sludge. The sludge removed from the waste-water treatment plant was placed on sludge drying beds. Dried material removed from the sludge drying beds was placed in the disposal trenches (also referred to as the East Trenches) until August 1968. The sanitary sludge disposal trenches are reported to be approximately 10 feet deep with two feet of soil cover (DOE, 1992). In addition, miscellaneous waste was also disposed in Trench T-4 including crushed drums, asphalt planking, and construction debris.

The numbering system for the trenches was slightly modified over time. A 1983 document describes a trench that had previously been referred to as Trench T-4 renumbered as T-11. This 1983 document placed the T-4 trench essentially as an addition to Trench T-3 (DOE, 1992).

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is present in the sludge (DOE, 1992). It is reported that the older sludge had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge was reported between a minimum of 382 pCi/g in August 1964, to a maximum of 3,591 pCi/g in June 1960. Uranium contamination may also be present in flattened drums that may have been disposed in any of trenches T-2 through T-11 following burning of the contaminated oils that had been held in the drum. Flattened drums, were identified in Trench T-4 (DOE, 1996b) and could be present in any of the East Trenches. It was estimated in a 1973 document that Trench T-4 may contain up to 16.2 grams of uranium-235.

Approximately 2,400 gallons of water and lathe coolant generated in Building 444 was also disposed in one of the East Trenches. This waste had an average activity of 150,000 dpm/l (believed to be total alpha activity). The activity of this material was reported as 1.35×10^8 dpm with approximately 1.3 kilograms (kg) of depleted uranium present in the waste. It is unknown whether this material was in drums (DOE, 1992).

Responses to Operation or Occurrence

A source removal action was performed in the summer of 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was authorized by the Proposed Action Memorandum (PAM) for the Source Removal at Trenches T-3 and T-4. IHSSs 110 and 111.1, Revision 2, dated March 28, 1996 (DOE, 1996a). Approximately 2,094 cubic yards of volatile organic compound (VOC) contaminated material was removed from Trench T-4 and treated. Approximately 150 cubic yards of debris, primarily crushed drums and junk, were also removed from the trench. Approximately 250 cubic yards of excavated soil which exceeded the Tier II radiological "put back" values was segregated and placed over 60 feet of geotextile grid liner (at the west end of Trench T-4) to a depth of 8 feet. Another liner was used to cover the soil and the area was marked prior to backfilling. A completion report for the project has been prepared and was submitted to DOE in September 1996. The completion report details the treatment process, contaminants removed, the condition of the trenches following the removal action, and includes sample analytical results.

Fate of Constituents Released to Environment

The soils treated as part of the source removal action were returned to the trench. Debris excavated from the trench were containerized pending characterization and are planned to be shipped to an off-site disposal facility in 1997 (DOE, 1996b). The source removal action for Trench T-4 removed contamination sources above the cleanup values stipulated in the PAM. The PAM also stipulated that excavation would stop if bedrock was encountered (DOE, 1996a). This occurred in Trench T-4 at approximately 20 feet deep. One sample result from this bedrock depth indicated contamination remained slightly above the cleanup value for trichloroethene (TCE). A contamination plume is known to exist below the trench as was the case for Trench T-3; however, contaminant levels are very low. It is believed that groundwater contamination generated from leaching of waste disposed of in Trench T-4 will cease as a result of the source removal.

Comments

Trench T-4 is part of the East Trenches.

Trenches T-4 through T-11 (PAC NE-111) have few operational differences from Trenches T-2 (PAC 900-109) and T-3 (PAC NE-110).

The sludge disposed of in these trenches should consist primarily of concentrated organic matter typically present in sanitary waste-water treatment plant sludge.

To date, no documentation has been found that records the time-frame during which any particular trench was receiving waste. Similarly, none of the HRR interviewees were knowledgeable on dates of operation of individual trenches.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1996a, *Proposed Action Memorandum for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111.1*, Revision 2, RF/ER-95-111.UN, March.

DOE, 1996b, *Draft Completion Report for the Source Removal at Trenches T-3 and T-4 IHSS 110 and 111.1*, RF/ER-96-0000, September.

PAC REFERENCE NUMBER: 000-121

IHSS Reference Number: 121, Operable Unit 9

Unit Name: Original Process Waste lines

Approximate Location: Plant-wide

Date(s) of Operation or Occurrence:

1952 - 1983 (approximate)

Description of Operation or Occurrence

Background Information

The Original Process Waste Lines (OPWL) are a network of tanks and underground pipelines constructed to transport and temporarily store aqueous chemical and radioactive process wastes from point of origin to on-site treatment and discharge points. The system handled process wastes from Buildings 123, 444, 707, 771, 776, 779, 865, 881, 883, and 889. Minor amounts of waste from Building 122 and Building 441 were also handled. Depending on the level of radioactivity and chemical composition, process wastes were routed to Building 774 for treatment, Pond B-2 (PAC NE-142.6), or the Solar Evaporation Ponds (PAC 000-101).

The OPWL was placed into service when the plant began production activities in 1952. Repairs and additions were made to the system through 1975. The OPWL was replaced beginning in 1975 by a double-contained, fully inspectable, process waste system completed in the summer of 1984. Most OPWL pipelines which were not converted to the new process waste system are believed to have been abandoned in place.

As defined in the 1988 OPWL Closure Plan, the OPWL consists of approximately 35,000 feet of pipeline and 39 separate tank locations which house a total of 73 tanks. OPWL tanks and pipelines exist in RFP areas 100, 400, 500, 600, 700, 800, and 900, the Solar Evaporation Ponds, and the northeast buffer zone between the 900 area and Pond B-2.

Numerous accidental releases of process waste occurred during the operating history of the OPWL. The Historical Release Report (DOE, 1992) provides detailed reference tables and specific narratives for description of operations and occurrences.

Physical/Chemical Description of Constituents Released

Aqueous process wastes containing low level radioactive materials, nitrates, caustics, and acids are known to have been transported in the OPWL. Small quantities of other liquids were also introduced to the system including pickling liquor from foundry operations, medical wastes, miscellaneous laboratory wastes, and laundry effluent. Certain process waste streams also contained metals, volatile organic compounds (VOCs), oils and greases, and cleaning

compounds. Low-level aqueous wastes with high concentrations of nitrate were the primary OPWL waste stream. Radionuclides present in the wastes include uranium-234 (U-234), U-235, U-238, plutonium-239 (Pu-239) and americium-241 (Am-241), with lesser amounts of Pu-240 and trace amounts of Pu-238, Pu-241, and Pu-242. Major VOCs used in plant processes include 1,1,1-trichloroethane, trichloroethene, and carbon tetrachloride. Other constituents potentially introduced include hexavalent chromium, beryllium, iodine, phosphate and tritium.

Response to Operation or Occurrence

The Historical Release Report (DOE, 1992) summarizes responses to OPWL releases in Table 000-2. Generally, upon the report of a release from OPWL piping or associated tanks, the area was excavated to make repairs and in some cases, the contaminated soils were removed from the release site for disposal. Contamination was primarily determined using field radiation detection equipment rather than by sample collection and analysis. Surface releases were sometimes flushed with water until radiation readings were within acceptable ranges. Contaminated soil and pavement were removed for disposal in some instances. In 1971, wells were drilled around many OPWL tanks located adjacent to and exterior to buildings to monitor plutonium, pH, nitrate, and fluoride in groundwater.

The Accelerated Action Plan for Interagency Agreement (IAG) Underground Storage Tanks (USTs) Containing RCRA-Regulated Materials (DOE, 1995) and the Final Proposed Action Memorandum (PAM)(DOE, 1996) specifically address the accelerated removal action and stabilization of potential contaminants in seven IAG underground tank systems. All of the tanks are within the OPWL system except Tank #4 (PAC 400-129) which is addressed under the 400 Area. Stabilization of the USTs is required to prevent migration of any residual contamination left in the tank after its contents have been removed and the tank has been multi-rinsed. An inert material, polyurethane foam, will be used to stabilize any remaining contamination until a final action is authorized such as a Record of Decision (ROD) or a RCRA Closure Plan. In accordance with the PAM, the completion report for this project will specifically address findings for Tanks T-2 and T-3 (IHSS 122), Tank 10 (IHSS 132), Tank 14 (IHSS 124.1), Tank 16 (IHSS 124.2-124.3) and Tank 40 (IHSS 121).

Additional study of OPWL tanks within buildings has been deferred to Decontamination and Decommissioning (D&D) activities. An investigation of outside OPWL tanks was completed in 1995 and included surficial soil sampling, radiological surveys, borehole sampling and logging, and groundwater sampling. Additional information can be located in the Draft Technical Memorandum No. 1, Addendum to Phase I RFI/RI Work Plan Field Sampling Plan, Volume 1, Part A, Outside Tanks, OU-9 Original Process Waste Lines.

Fate of Constituents Released to Environment

The level of detail provided in documentation of known OPWL pipeline/tank releases is not sufficient to define lateral and vertical extent of the individual releases.

Action/No Action Recommendation

IHSS 121 (PAC Reference No. 000-121, and associated tanks) is not being proposed as a No Action/No Further Action; however, select areas (specifically tank systems) may become candidates for NFA or RCRA Closure as specified in the completion report for this Accelerated Action in accordance with the Final Proposed Action Memorandum (PAM) (DOE, 1996).

Comments

This PAC narrative is an update only to report recent progress made toward specific Tanks within the Original Process Waste Line system and is not intended to replace facts presented in the Historical Release Report (DOE, 1992) for IHSS 121. A completion report for this Accelerated Action is being prepared in accordance with the Final Proposed Action Memorandum (PAM) approved April 25, 1996.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995, *Accelerated Action Plan for Interagency Agreement (IAG) Underground Storage Tanks (USTs) Containing RCRA-Regulated Materials*, Rocky Flats Environmental Technology Site, Golden, CO, December.

DOE, 1996, *Final Proposed Action Memorandum (PAM) for the Contaminant Stabilization of Underground Storage Tanks*, Rocky Flats Environmental Technology Site, Golden, CO, April.

PAC REFERENCE NUMBER: 400-129

IHSS Reference Number: 129, Operable Unit 10

Unit Name: Oil Leak

Approximate Location: N749,000; E2,082,500

Date(s) of Operation or Occurrence:

1952 - Present (Tanks #1 - #3; one of which was installed in 1967)

1967 - 1986 (Tank#4)

Description of Operation or Occurrence

There are four No. 6 fuel oil supply tanks located east of Building 443, two of which were installed in 1952 and two in 1967. They measure approximately 11 by 20 feet and are buried under two feet of soil. The tanks were used as local supply tanks to Building 443 (Steam Plant) when natural gas was unavailable. Releases of No. 6 fuel oil are known to have occurred from filling operations and related maintenance since the tanks were first installed.

From 1952 to 1967, fuel was transferred from the larger tanks south of Building 551 to tanker trucks which in turn transferred the fuel to the supply tanks. Small spills were noted during this process (DOE, 1992). This practice ceased when underground transfer lines were installed in 1967. In November 1977, a leak in the underground transfer line was discovered (DOE, 1992). No documentation was found that detailed the quantity of oil released to the environment; however, the sewage treatment plant was able to recover 600 gallons of oil. Since 1983, aboveground transfer lines have been used. Contamination in the area became evident on March 6, 1986, when compressor oil was found at the bottom of a four and a half foot deep excavation located in the vicinity of the tanks. Three days later, No. 6 fuel oil was discovered in another excavation. The excavations were required to install a chain-link fence on the east side of Building 443 (DOE, 1992).

The 1987 Closure Plan for Tank #4 indicates that there was a leak in the top of tank #4. The level indicator recorded no drops in the fuel oil level; however, there were increases in the level due to water seeping into the tank (DOE, 1992). On February 6, 1989, the level indicator in one of the tanks failed while it was being filled allowing about 500 gallons of No. 6 fuel oil to be released to the immediate area and onto Fifth St. The spill did not reach a drainage or watercourse. Four days later, 50 more gallons were spilled because the valves were left open (DOE, 1992). On July 29 and 30, 1989, 1,700 gallons were again released to the environment. No documentation could be found which detailed the cause of this most recent spill (DOE, 1992).

Physical/Chemical Description of Constituents Released

Samples of the oil found in the excavations were analyzed. The primary constituent was No. 6 fuel oil with traces of No. 2 diesel oil. Results also showed trace amounts of 1,1,1-TCA (trichloroethane) (DOE, 1992).

Response to Operation or Occurrence

No documentation was found which detailed a response to the cracked transfer pipe in 1977. It was assumed that due to the low viscosity of the oil, it would not migrate underground (DOE, 1992). In February 1989, the oil was left on the ground until the next day to let it solidify in the cold. The State oil inspector was notified for the cases occurring in 1986 and 1989.

The IHSS 129 Accelerated Action Project initiated on July 22, 1996, involves emptying, cleaning and foaming Tank #4. The first two phases of the project are being performed as a routine maintenance action. Foaming of Tank #4 will be performed in accordance with the Final Proposed Action Memorandum (PAM) for the Contaminant Stabilization of Underground Storage Tanks approved on May 16, 1996 (DOE, 1996). The project is scheduled to be completed by September 30, 1996.

Fate of Constituents Released to Environment

No documentation was found which detailed the fate of constituents released to the environment.

Action/No Action Recommendation

Final status of IHSS 129, Tank #4, Source Removal will be documented in the final report for this work in accordance with the PAM (DOE, 1996).

Comments

In 1970, a 1,500-gallon sulfuric acid spill occurred near Building 443 and was contained in a pit (PAC 400-187.2). A sodium hydroxide spill of approximately 1,000 gallons was released from the steam plant catch basin to Central Avenue (PAC 000-190). Both instances have contributed to potential contamination in the area.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1996, *Proposed Action Memorandum for the Contaminant Stabilization of Underground Storage Tanks*, Rocky Flats Plant, Golden, CO, May.

PAC REFERENCE NUMBER: 900-109

IHSS Reference Number: 109, Operable Unit 2

Unit Name: Ryan's Pit (Previous Name, Trench T-2)

Approximate Location: N748,600; E2,085,800

Date(s) of Operation or Occurrence

1969 - 1971

Description of Operation or Occurrence

Ryan's Pit is located south of the 903 Pad (PAC 900-112) and was primarily used for disposal of nonradioactive solvents, paint thinners, and other construction related chemicals/materials (DOE, 1992). The operation was to perform radiation screening of the waste and if identified as nonradioactive, the solvents were dumped in the trench as a method of disposal. The trench is referred to as Ryan's Pit after a member of the Waste Disposal Co-Ordination Group who was involved with past solvent disposal.

After a review of the information gathered in preparation of the Historical Release Report (DOE, 1992), it is believed that Ryan's Pit was not used in the same manner as the East Trenches as indicated in RCRA 3004(u). Based on a review of historical documents, an evaluation of many historical photographs, and interviews with former RFP personnel who were directly involved with plant waste disposal activities, it is probable that Ryan's Pit was used from approximately 1969 to 1971 for the disposal of nonradioactive liquid chemical wastes. Previously, Ryan's Pit was believed to have been used similarly to the East Trenches because of discussion in a 1970 document entitled "A Summary of On Site Radioactive Waste Disposal". An evaluation of aerial and low-angle oblique photographs was made and included the years 1953, 1955, 1957, 1964, 1969, 1970, and 1971. Activities involving on-site burial of sludge from the sanitary waste-water treatment plant occurred from July 1954 through August 1968. These photographs clearly indicate the existence of the East Trenches in various stages of development. Yet none of the photographs from 1953 through 1968 provides any indication of ground disturbances in the area of Ryan's Pit. Furthermore, the photographs indicate the trench as being open in 1969 and 1970. The burial of sanitary waste-water treatment sludge on plantsite ceased by August 14, 1968, at which time sludge began to be disposed of in the Present Landfill (PAC NW-114) (DOE, 1992).

Instead, it is believed that Trench T-2 was used for the disposal of liquid waste between 1969 and 1971. Photographs of the area are available from 1969, 1970, and 1971. In 1969 and 1970, there clearly is an open trench in the area south of the 903 Pad and in the general area as located in the 1970 report. In a May 1971, photograph, the trench is backfilled and graded, but still visible.

Physical/Chemical Description of Constituents Released

Soils contaminated from the dumping of solvents and other wastes were sampled extensively upon removal in 1995 and prior to treatment, showed elevated volatile organic compounds including tetrachloroethene, xylene, toluene, 1,1,1-trichloroethane, trichloroethene, and ethylbenzene. Radiological samples collected show plutonium-239, americium-241 and uranium-233-234, 235 and 238 at levels above background in the excavated soils; however, these radiological levels are less than the 15 mrem hypothetical future resident scenario (the most restrictive scenario for the future land use of the site).

Responses to Operation or Occurrence

Disposal of waste at Ryan's Pit was discontinued in 1971 and the trench was backfilled. The IHSS 109 Accelerated Action Project was initiated in September of 1995 as a Source Removal in accordance with the Final Proposed Action Memorandum (PAM) approved August 28, 1995 (DOE, 1995a). The removal of contaminated soil from Ryan's Pit was completed in September 1995. Upon final approval from CDPHE for a modification to the existing RCRA Part B permit, approximately 200 cubic yards of contaminated soil was treated using low temperature thermal desorption processes. Based upon the 15 mrem hypothetical future resident scenario for the site, the treated soil was placed back into the excavation on September 18, 1996.

Fate of Constituents Released to Environment

Solvents that may have been dumped included perchloroethylene, trichloroethane, and possibly carbon tetrachloride, though not as likely. These were the solvents typically used at the plant during the time-frame. Other chemicals which were dumped included paint thinner and small quantities of construction-related chemicals. RFI/RI investigations for Operable Unit 2 have identified elevated levels of volatile organic compounds (VOCs) in groundwater down-gradient from the Ryan's Pit location (DOE, 1995b).

Action/No Action Recommendation

Final status of recent actions taken at Ryan's Pit are documented in a completion report and will be submitted in accordance with the Proposed Action Memorandum (PAM) approved August 28, 1995.

Comments

None

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995a, *Final Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit*, Rocky Flats Plant, Golden, CO, August.

DOE, 1995b, *Final OU 2, Phase II RFI/RI Report*, Rocky Flats Plant, Golden, CO, October.

PAC REFERENCE NUMBER: 900-119.1

IHSS Reference Number: 900-119.1

Unit Name: West Scrap Metal Storage and Solvent Spill Area

Approximate Location: N748,000; E2,085,000

Date(s) of Operation or Occurrence:

September 1968 - November 1971

Description of Operation or Occurrence

This area was one of two sites used for scrap metal storage in the southeast portion of the 400 acre manufacturing area. PAC 900-119.1 was the western site located on a flat area just north of the Southeast Perimeter Road. In September 1968, arrangements were made to move a scrap metal pile (PAC 900-119.2) from its location near the lithium disposal pit (PAC 900-140) to a new area 200 yards to the west in an attempt to limit traffic through the area (DOE, 1992). Aerial photographs reveal the storage of material in piles and rows in both 1969 and 1970. Some of the material stored may have been in drums. The scrap metal was stored for eventual recycle offsite (DOE, 1992).

Physical/Chemical Description of Constituents Released

Pieces of scrap metal which came from various buildings on plantsite may have had residual oils and/or hydraulic coolants on them which could have dripped off into the soil. Higher than normal air samples in November 1971, were attributed to the bulldozing of the area during clean-up activities to disposition the scrap metal. Three hot spots were found during a routine radiometric survey in August 1981 (DOE, 1992). Two additional hot spots were identified during Phase III Final RFI/RI investigations in 1994 (DOE, 1995).

Further investigation in 1994 during source removal activities (see below) show that the hot spot dimensions were determined to be approximately 10 inches in diameter and 12 inches deep, with plutonium activities ranging from 10 nanoCuries per gram (nCi/g) (surface) to 50 picoCuries per gram (pCi/g) (at 1 foot) (DOE, 1994).

Response to Operation or Occurrence

The area south of the 903 Pad was cleaned up in December, 1971 and disturbed soil was re-vegetated in the following spring. Groundwater samples collected from monitoring wells installed in the area in 1974 had anomalous concentrations of uranium and nitrate. Additional test holes were drilled in April 1982 to attempt to locate buried materials which might have been contributing leachate into the well waters. No buried debris was located but several of the test holes were maintained as test sites for water sampling during the three subsequent months.

In 1994, an Accelerated Response Action (ARA) consisting of the removal of radionuclide contaminated soils ("hot spots") at five specific locations within IHSSs 119.1 and one location within IHSS 119.2 was conducted. The hot spots were localized shallow contaminated soils that contained substantial activities of either plutonium/americium or uranium, as well as traces of several organic compounds. The ARA included excavation, containerization, storage, and disposal of twenty-one 55 gallon drums of radionuclide contaminated soil. The drums were disposed of at the Envirocare facility in Utah which is permitted to accept mixed low-level wastes. The source removal of contaminants from these hot spot areas reduced potential risks by several orders of magnitude and are below 10^{-4} (DOE, 1995).

Fate of Constituents Released to Environment

No documentation was found which detailed the fate of the constituents released to the environment. Removal of the Operable Unit No. 1 "hot spots" within IHSS 119.1 reduced potential risk to human health and the environment by removing known "source areas"; however, further contamination outside of the hot spot areas exists at this location.

Action/No Action Recommendation

Proposed actions to be taken within IHSS 119.1 were decided in 1995 through the Dispute Resolution process as described in the IAG. The preferred remediation alternative for IHSS 119.1 is to excavate soils contaminated with organic solvents. The final remediation decision will be decided with the approved CAD/ROD.

Comments

CEARP interview notes reference areas south of the 903 PAD, south of Building 952, and east of Building 881 as areas which contained construction debris, scrap metal, paper, and other miscellaneous trash. The time frame for this activity was from 1960 to 1961. No documentation could be found which detailed specific activities in this area at that time-frame. An aerial photograph dated 1964 does not indicate any ground disturbance in the area.

This area was identified in RCRA 3004(u) as being used for solvent storage. No documentation was found which supports this and retired RFP employees interviewed for the HRR (DOE, 1992) disputed that the area had ever received solvents. Scrap metal was stored in drums or on the ground. Areas were indicated with power poles to segregate types of scrap metal. Some of the scrap metal pieces may have been coated with solvents or other materials before being transported to the area.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1994, *Proposed Action Memorandum, Hot Spot Removal, Operable Unit No. 1*, Rocky Flats Environmental Technology Site, Rocky Flats Plant, Golden, CO, September.

DOE, 1995, *Accelerated Response Action Completion Report, Hot Spot Removal*, Rocky Flats Environmental Technology Site (Operable Unit No. 1), Rocky Flats Plant, Golden, CO, April.

PAC REFERENCE NUMBER: 900-119.2

IHSS Reference Number: 900-119.2

Unit Name: East Scrap Metal Storage and Solvent Spill Area

Approximate Location: N748,000; E2,085,500

Date(s) of Operation or Occurrence:

September 1968 - November 1971

Description of Operation or Occurrence

This area was one of two sites used for scrap metal storage in the southeast portion of the 400 acre manufacturing area. PAC 900-119.2 was the eastern site located on a flat area just north of the Southeast Perimeter Road. In September 1968, arrangements were made to move the scrap metal pile (PAC 900-119.2) from its location near the lithium disposal pit (PAC 900-140) to a new area 200 yards to the west in an attempt to limit traffic through the area (DOE, 1992). The area was located adjacent to a known Hazardous Disposal Area (PAC 900-140) and it was felt at the time that uninformed users of the scrap metal storage area were unnecessarily endangering themselves due to the close proximity of PAC 900-140. The area was located 60 feet north and 50 feet west of the fence marking the Hazardous Disposal Area. Aerial photographs reveal the storage of material in piles in both 1969 and 1970 (DOE, 1992).

Physical/Chemical Description of Constituents Released

Pieces of scrap metal which came from various buildings on plantsite may have had residual oils and/or hydraulic coolants on them which could have dripped off into the soil. Higher than normal air samples in November 1971, were attributed to the bulldozing of the area during clean-up activities to disposition the scrap metal.

Further investigation in late 1994 during Source Removal activities (see below) show that the hot spot dimensions were determined to be approximately 10 inches in diameter and 12 inches deep, with activities ranging from 10 nanoCuries per gram (nCi/g) (surface) to 50 picoCuries per gram (pCi/g) (at 1 foot) (DOE, 1994).

Response to Operation or Occurrence

The area south of the 903 Pad was cleaned up in December, 1971 and disturbed soil was re-vegetated in the following spring. Groundwater samples collected from monitoring well installed in the area in 1974 had anomalous concentrations of uranium and nitrate.

In 1994, an Accelerated Response Action (ARA) consisting of the removal of radionuclide contaminated soils ("hot spots") at five specific locations within IHSSs 119.1 and one location within IHSS 119.2 was conducted. The hot spots were localized shallow contaminated soils

that contained substantial activities of either plutonium/ameridium or uranium, as well as traces of several organic compounds. The ARA included excavation, containerization, storage, and disposal of twenty-one 55 gallon drums of radionuclide contaminated soil. The drums were disposed of at the Envirocare facility in Utah which is permitted to accept mixed low-level wastes. The source removal of contaminants from these hot spot areas reduced potential risks by several orders of magnitude and are below 10^{-4} (DOE, 1995).

Fate of Constituents Released to Environment

The area south of the 903 Pad was cleaned up in December, 1971 and disturbed soil was re-vegetated in the following spring. Groundwater samples collected from monitoring wells installed in the area in 1974 had anomalous concentrations of uranium and nitrate.

No documentation was found which detailed the fate of the constituents released to the environment; however, removal of the Operable Unit No. 1 "hot spot" within IHSS 119.2 reduced potential risk to human health and the environment by removing a known "source area".

Action/No Action Recommendation

No Action is being proposed in the Draft CAD/ROD for IHSS 119.2

Comments

CEARP interview notes reference areas south of the 903 Pad, south of Building 952, and east of Building 881 as areas which contained construction debris, scrap metal, paper, and other miscellaneous trash. The time frame for this activity was from 1960 to 1961. No documentation could be found which detailed specific activities in this area at that time-frame. An aerial photograph dated 1964 does not indicate any ground disturbance in the area.

This area was identified in RCRA 3004(u) as being used for solvent storage. No documentation was found which supports this and retired RFP employees interviewed for the HRR (DOE, 1992) disputed that the area had ever received solvents. Scrap metal was stored in drums or on the ground. Areas were indicated with power poles to segregate types of scrap metal. Some of the scrap metal pieces may have been coated with solvents or other materials before being transported to the area.

References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, August.

DOE, 1994, *Proposed Action Memorandum, Hot Spot Removal, Operable Unit No. 1*, Rocky Flats Environmental Technology Site, Rocky Flats Plant, Golden, CO, September.

DOE, 1995, *Accelerated Response Action Completion Report, Hot Spot Removal*, Rocky Flats Environmental Technology Site (Operable Unit No. 1), Rocky Flats Plant, Golden, CO, April.

SECTION 5.0

TABLE 1

TABLE 1
PACS IDENTIFIED IN QUARTERLY UPDATES

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
142.6	6	NA	NE-1404	Diesel Spill at Pond B-2 Spillway	2
NA	2	NA	NE-1405	Diesel Fuel Spill at Field Treatability Unit (<i>formerly NE- 1404</i>)	3
NA	4	NA	NE-1406	771 Hillside Sludge Release	4
NA	2	93-002	NE-1407	OU 2 Treatment Facility	4
NA	2	93-005	NE-1408	OU 2 Test Well (<i>formerly NE- 1406</i>)	4
NA	4	93-007	NE-1409	Modular Tanks and 910 Treatment System Spill (<i>formerly 000-503</i>)	5
NA	2	NA	NE-1410	Diesel Fuel Spill at Field Treatability Unit	7
NA	2	NA	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	7
NA	2	NA	NE-1412	Trench T-12 Located in OU-2 East Trenches	10
NA	2	NA	NE-1413	Trench T-13 Located in OU-2 East Trenches	10
NA	10	NA	NW-1500	Diesel Spill at PU&D Yard (<i>formerly NW-175</i>)	2
NA	10	NA	NW-1501	Asbestos Release at PU&D Yard (<i>formerly NW-176</i>)	2
114	7	92-021	NW-1502	Improper Disposal of Diesel Contaminated Material at Landfill (<i>formerly NW-177</i>)	2

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
114	7	92-004	NW-1503	Improper Disposal of Fuel Contaminated Material at Landfill	1
114	7	94-002	NW-1504	Improper Disposal of Thorosilane Contaminated Material at Landfill	7
NA	5	NA	SW-1701	Recently Identified Ash Pit	9
NA	5	NA	SW-1702	Recently Identified Ash Pit	9
NA	NA	94-005	000-503	Solar Pond Water Spill Along Central Avenue	7
NA	NA	93-003	100-613	Asphalt Surface in Lay Down Yard North of Building 130 (formerly identified as 000-501)	4
NA	NA	93-003	300-711	Ni-Cad Battery Spill Outside of Building 373	1
NA	NA	92-002	300-712	1/2 gal Antifreeze Spilled by Street Sweeper Outside of Building 373	1
NA	NA	94-006	300-713	Caustic Spill North of Building 331	8
NA	NA	94-012	300-714	Laundry Waste Water Spill From Tank T-803, North of Building 374	10
NA	NA	NA	400-811	Transformer 443-2, Building 443	2

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
NA	NA	93-009	400-812	Tank T-2 Spill in Building 460	6
NA	NA	94-001	400-813	RCRA Tank Leak in Building 460	7
NA	NA	94-007	400-814	Air Conditioner Compressor Release, Building 444 Roof	8
NA	NA	94-008	400-815	RCRA Tank Leak in Building 460	8
NA	NA	93-004	500-906	Asphalt Surface Near Building 559	4
172	13	94-009	500-907	Tanker Truck Release of Hazardous Waste From Tank 231B	9
156.1, 186	13, 14	95-003	500-908	Oil Released from Air Compressor	12
152, 157.1, 172	12	NA	600-1004	Central Avenue Ditch Cleaning Incident (formerly identified as 400-820)	6
NA	NA	NA	600-1005	Former Pesticide Storage Area	7
101	4	95-002	700-113	Water Released from the 207C Solar Evaporation Pond	11
NA	NA	92-005	800-1212	Building 866 Sump Spill	5
NA	NA	NA	900-1308	Gasoline Spill Outside of Building 980	6
NA	2	93-010	900-1309	OU 2 Field Treatability Unit Spill	6

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
NA	NA	92-023	900-1310	ITS Water Spill (formerly identified as 000-502)	2
NA	NA	NA	900-1311	Septic Tank East of Building 991	7
NA	2	94-004	900-1312	OU-2 Water Spill	7
192	16	NA	900-1313	Seep Area Near OU-2 Influent	9
101	4	94-010	900-1314	Solar Evaporation Pond 207B Sludge Release	9
NA	NA	94-013	900-1315	Tanker Truck Release on East Patrol Road, North of Spruce Ave.	11
NA	NA	NA	900-1316	Elevated Chromium (total) Identified During Geotechnical Drilling	10
176	10	95-001	900-1317	Soil Released from Wooden Crate in 964 Laydown Yard	11

¹NA = Not applicable. Not all PACs are located in Individual Hazardous Substance Sites (IHSSs) or Operable Units (OUs). Likewise, not all PACs are identified in RCRA Contingency Plan Implementation Reports (CPIRs). The Operable Unit designation, as referenced in this report, corresponds to pre-1996 terminology and not the more recent Consolidated Operable Unit allocation.

²RCRA Contingency Plan Implementation Reports (CPIRs) identified during the Twelfth Quarter include CPIR 95-003. This incident involved a release to the environment and is therefore identified as a PAC.

³Several PAC numbers have been revised to reflect a more accurate location on the PAC map. Former PAC numbers are identified in parentheses within italics.

SECTION 6.0

TABLE 2

TABLE 2
ORIGINAL POTENTIAL AREAS OF CONCERN
SUBMITTED IN HISTORICAL RELEASE REPORT - JUNE 1992

IHSS NO.	OU NO. ¹	PAC NO.	PAC NAME	PAGE
NORTHEAST BUFFER ZONE				
NA	NA	NE-1400	Tear Gas Powder Release	NE-36
NA	NA	NE-1401	NE Buffer Zone Gas Line Break	NE-37
NA	NA	NE-1402	East Inner Gate PCB Spill	NE-38
NA	NA	NE-1403	Gasoline Spill - Building 920 Guard Post	NE-39
SOUTHEAST BUFFER ZONE				
NA	NA	SE-1600	Pond 7 - Steam Condensate Releases	SE-10
NA	NA	SE-1601	Pond 8 - Cooling Tower Discharge Releases	SE-13
SOUTHWEST BUFFER ZONE				
NA	NA	SW-1700	Fuel Spill into Woman Creek Drainage	SW-15
000 AREA				
NA	NA	000-500	Sanitary Sewer System	000-49
NA	NA	000-501	Roadway Spraying	000-60
100 AREA				
NA	NA	100-600	Mercury Spill - Valve Vault 124-B, Building 124	100-8
NA	NA	100-601	Building 123 Phosphoric Acid Spill	100-10
NA	NA	100-602	Building 123 Process Waste Line Break	100-11
NA	NA	100-603	Building 123 Bioassay Waste Spill	100-13
NA	NA	100-604	T130 Complex Sewer Line Leaks	100-15
NA	NA	100-605	Building 115 Hydraulic Oil Spill	100-16
NA	NA	100-606	Building 125 TCE Spill	100-17
NA	NA	100-607	Building 111 Transformer PCB Leak	100-18
NA	NA	100-608	Building 131 Transformer Leak	100-20
NA	NA	100-609	Building 121 Security Incinerator	100-21
NA	NA	100-610	Asbestos Release - Building 123	100-22
NA	NA	100-611	Building 123 Scrubber Solution Spill	100-23
NA	NA	100-612	Battery Solution Spill - Building 119	100-25
300 AREA				

TABLE 2 (continued)

IHSS NO.	OU NO. ¹	PAC NO.	PAC NAME	PAGE
NA	NA	300-700	Scrap Roofing Disposal	300-25
NA	NA	300-701	Sulfuric Acid Spill - Building 371	300-26
NA	NA	300-702	Pesticide Shed	300-27
NA	NA	300-703	Building 331 North Area	300-28
NA	NA	300-704	Roof Fire, Building 381	300-29
NA	NA	300-705	Potassium Hydroxide Spill North of Building 374	300-30
NA	NA	300-706	Evaporator Tanks North of Building 374	300-31
NA	NA	300-707	Sanitizer Spill	300-33
NA	NA	300-708	Transformers North of Building 371	300-34
NA	NA	300-709	Transformer Leak 334-1	300-35
NA	NA	300-710	Gasoline Spill North of Building 331	300-36
400 AREA				
NA	NA	400-800	Transformer 443-1	400-40
NA	NA	400-801	Transformer, Roof of Building 447	400-41
NA	NA	400-802	Storage Area, South of Building 334	400-42
NA	NA	400-803	Miscellaneous Dumping, Building 460 Storm Drain	400-44
NA	NA	400-804	Road North of Building 460	400-45
NA	NA	400-805	Building 443 Tank #9 Leak	400-46
NA	NA	400-806	Catalyst Spill, Building 440	400-47
NA	NA	400-807	Sandblasting Area	400-48
NA	NA	400-808	Vacuum Pump Leak - Building 442	400-49
NA	NA	400-809	Oil Leak - 446 Guard Post	400-51
NA	NA	400-810	Beryllium Fire - Building 444	400-52
500 AREA				
NA	NA	500-900	Transformer Leak - 515/516	500-15
NA	NA	500-901	Transformer Leak - 555	500-17
NA	NA	500-902	Transformer Leak - 559	500-18
NA	NA	500-903	RCRA Storage Unit #1	500-19

TABLE 2 (continued)

IHSS NO.	OU NO. ¹	PAC NO.	PAC NAME	PAGE
NA	NA	500-904	Transformer Leak - 223-1/223-2	500-20
NA	NA	500-905	Transformer Leak - 558-1	500-22
600 AREA				
NA	NA	600-1000	Transformer Storage Building 662	600-18
NA	NA	600-1001	Temporary Waste Storage Building 663	600-20
NA	NA	600-1002	Transformer Storage - West of Building 666	600-24
NA	NA	600-1003	Transformers North and South of 661-675 Substation	600-25
700 AREA				
NA	NA	700-1100	French Drain North of Building 776/777	700-76
NA	NA	700-1101	Laundry Tank Overflow - Building 732	700-77
NA	NA	700-1102	Transformer Leak - 776-4	700-78
NA	NA	700-1103	Leaking Transformers - Building 707	700-80
NA	NA	700-1104	Leaking Transformers - Building 708	700-82
NA	NA	700-1105	Transformer Leak - 779-1/779-2	700-83
NA	NA	700-1106	Process Waste Spill - Portal 1	700-84
NA	NA	700-1107	Compressor Waste Oil Spill - Building 776	700-86
NA	NA	700-1108	771/774 Footing Drain Pond	700-87
NA	NA	700-1109	Uranium Incident - Building 778	700-90
NA	NA	700-1110	Nickel Carbonyl Burial West of Building 771	700-91
NA	NA	700-1111	Leaking Transformer - Building 750	700-92
NA	NA	700-1112	Leaking Transformer - 776-5	700-93
800 AREA				
NA	NA	800-1200	Valve Vault 2	800-28
NA	NA	800-1201	Radioactive Site South of Building 883	800-30
NA	NA	800-1202	Sulfuric Acid Spill, Building 883	800-31
NA	NA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	800-32
NA	NA	800-1204	Building 866 Spills	800-33

TABLE 2 (continued)

IHSS NO.	OU NO. ¹	PAC NO.	PAC NAME	PAGE
NA	NA	800-1205	Building 881, East Dock	800-35
NA	NA	800-1206	Fire, Building 883	800-36
NA	NA	800-1207	Transformer 883-4	800-37
NA	NA	800-1208	Transformer 881-4	800-38
NA	NA	800-1209	Leaking Transformers, 800 Area	800-39
NA	NA	800-1210	Transformer 865-1 and 865-2	800-40
NA	NA	800-1211	Capacitor Leak, Building 883	800-41
900 AREA				
NA	NA	900-1300	RO Plant Sludge Drying Beds	900-47
NA	NA	900-1301	Building 991 Enclosed Area	900-48
NA	NA	900-1302	Gasoline Spill	900-50
NA	NA	900-1303	Natural Gas Leak	900-51
NA	NA	900-1304	Chromic Acid Spill - Building 991	900-52
NA	NA	900-1305	Building 991 Roof	900-53
NA	NA	900-1306	Transformers 991-1 and 991-2	900-54
NA	NA	900-1307	Explosive Bonding Pit	900-55

¹The Operable Unit designation, as referenced in this report, corresponds to pre-1996 terminology and not the more recent Consolidated Operable Unit allocation.

SECTION 7.0

TABLE 3

TABLE 3
NEW PACS AND PAC/IHSS REVISIONS IDENTIFIED IN FIRST ANNUAL UPDATE
(AUGUST, 1996)

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Update Source
110	2	NA	NE-110	Trench T-3	HRR
111.1	2	NA	NE-111.1	Trench T-4	HRR
142.12	6	NA	NE-142.12	Flume Pond (Walnut Creek Gauging Station); A-5 Retention Pond	HRR
166.1	6	NA	NE-166.1	Trench A, South of Present Landfill	HRR
166.2	6	NA	NE-166.2	Trench B, South of Present Landfill	HRR
166.3	6	NA	NE-166.3	Trench C, South of Present Landfill	HRR
167.2& 167.3	7	NA	NE-167.2 NE-167.3	North and South Area Spray Fields	HRR
216.1	6	89-001	NE-216.1	East Spray Field, North Area	HRR
195	16	NA	NW-195	Nickel Carbonyl Disposal	HRR
203	7	NA	NW-203	Inactive Hazardous Waste Storage Area	HRR
121	9	NA	000-121	Original Process Waste Lines	HRR
168	11	NA	000-168	West Spray Field	HRR
192	16	NA	000-192	Antifreeze Discharge	HRR
NA	NA	NA	300-708	Transformers North of Building 371	HRR
NA	NA	NA	300-709	Transformer Leak, 334-1	HRR

TABLE 3 (continued)

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Update Source
129	10	NA	400-129	Oil Leak	HRR
193	16	NA	400-193	Steam Condensate Leak	HRR
204	15	NA	400-204	Original Uranium Chip Roaster	HRR
NA	NA	NA	500-900	Transformer Leak - 515/516	HRR
NA	NA	NA	500-901	555 Transformer Leak at Substation	HRR
NA	NA	NA	500-902	Transformer Leak - 559	HRR
NA	NA	NA	500-905	558 Transformer Leak at Substation	HRR
158	13	96-001	500-909	Release of Spent Photographic Fixer Solution	Aug. 1996 Annual
NA	NA	NA	600-1000	Transformer Storage Outside Building 662	HRR
NA	NA	NA	600-1002	Transformer Storage, West of Building 666	HRR
NA	NA	NA	600-1003	Transformers North and South of 661/675 Substation	HRR
185	16	NA	700-185	Solvent Spill	HRR
194	16	NA	700-194	Steam Condensate Leak - 700 Area	HRR
NA	NA	NA	700-1102	Transformer Leak, 776-4	HRR

TABLE 3 (continued)

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Update Source
NA	NA	NA	700-1103	Leaking Transformers, Building 707	HRR
NA	NA	NA	700-1104	Leaking Transformer, Building 708	HRR
NA	NA	NA	700-1111	Leaking Transformer, Building 750	HRR
NA	NA	NA	700-1112	Leaking Transformer, Building 776-5	HRR
178	15	NA	800-178	Building 881 Drum Storage Area	HRR
179	15	NA	800-179	Building 865 Drum Storage Area	HRR
180	15	NA	800-180	Building 883 Drum Storage Area	HRR
211	15	NA	800-211	Building 881 Drum Storage Area, Unit 26	HRR
217	15	NA	800-217	Building 881 Cyanide Bench Scale Treatment, Unit 32	HRR
NA	NA	NA	800-1207	Transformer 883-4	HRR
NA	NA	NA	800-1208	Transformer 881-4	HRR
NA	NA	NA	800-1209	Leaking Transformers, 800 Area	HRR
NA	NA	NA	800-1210	Transformers 865-1 and 865-2	HRR
109	2	NA	900-109	Trench T-2, (Ryan's Pit)	HRR

TABLE 3 (continued)

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Update Source
119.1	1	NA	900-119.1	West Scrap Metal Storage and Solvent Spill	HRR
119.2	1	NA	900-119.2	East Scrap Metal Storage and Solvent Spill	HRR
NA	NA	NA	900-1306	Transformers 991-1 and 991-2	HRR

¹NA = Not applicable. Not all PACs are located in Individual Hazardous Substance Sites (IHSSs) or Operable Units (OUs). Likewise, not all PACs are identified in RCRA Contingency Plan Implementation Reports (CPIRs). The Operable Unit designation, as referenced in this report, corresponds to pre-1996 terminology and not the more recent Consolidated Operable Unit allocation.

²RCRA Contingency Plan Implementation Reports (CPIRs) identified in the First Annual Update to the HRR include CPIR 96-001. This incident involved a release to the environment and is therefore identified as a PAC.

³Several PAC numbers have been revised to reflect a more accurate location on the PAC map. Former PAC numbers are identified in parentheses within italics.

SECTION 8.0

REVISED IHSS AND PAC

MAPS

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: RF/ER-96-0046)

Annual Update for the Historical Release Report

August 1996

Individual Hazardous Substance Sites by Operable Unit

Map ID: x8682

September 18, 1996

CERCLA Administrative Record Document, SW-A-002440

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: RF/ER-96-0046)

Annual Update for the Historical Release Report

August 1996

Potential Areas of Concern

Map ID: s0001

September 27, 1996

CERCLA Administrative Record Document, SW-A-002440

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

Potential Areas of Concern

EXPLANATION

☐ No Further Action Warranted

Standard Map Features


Buildings and other structures Lakes and ponds

Streams, ditches, or other drainage features

Paved roads

Dirt roads

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Eng'r,
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)
PAC's
Historical Release Report (HRR)
Twelfth Quarterly Update
July 31, 1995

Public Access to Information

Potential Area of Concern	000 1310
000 1310	000 1310

UE-1406 Potential Area of Concern Point Spill



Scale = 1 : 3000
1 inch represents 250 feet



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:



**Rocky Mountain
Remediation Services, L.L.C.**
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID: s0001

September 27, 1996

